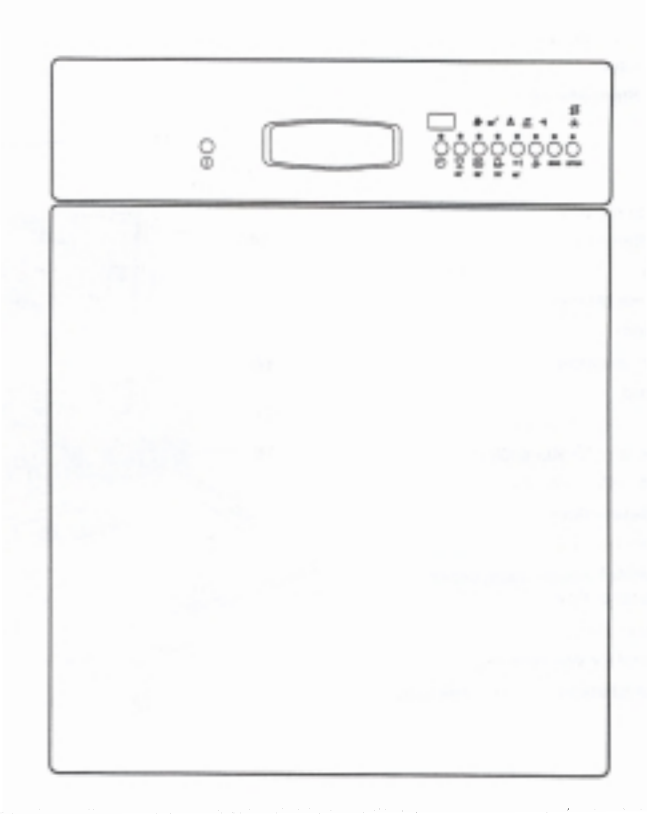
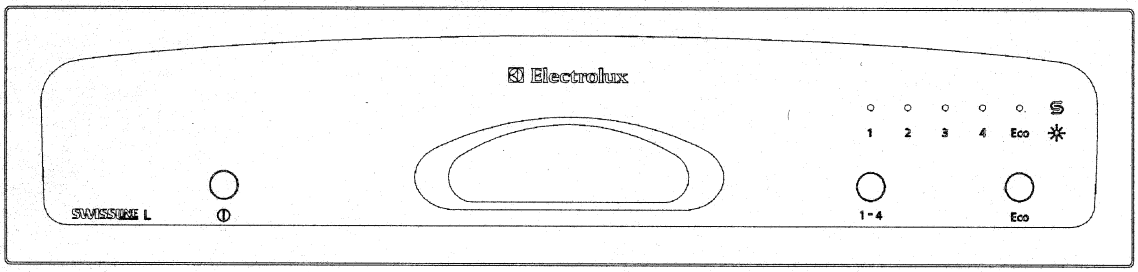
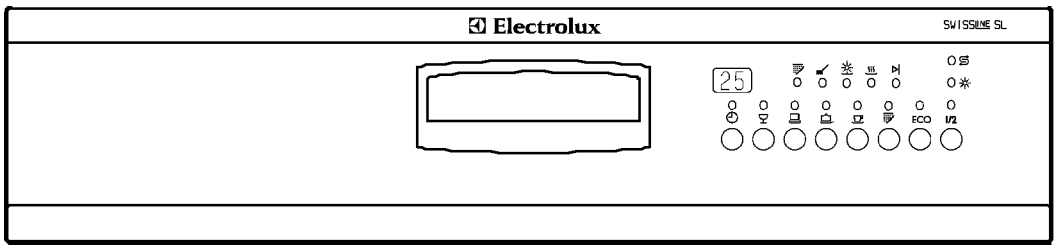
SERVICE MANUAL

DISHWASHER







Dishwasher

GS 23 CH
GS 24 CH

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Safety Instructions

Attention : Whenever intervention into the machine becomes necessary, observe all safety precautions mentioned in DIN/VDE 0701 (repair-related) and/or VDE 0700/ICE 65 (appliance-related).

Components are in accordance with IEC and/or VDE directives! For replacements use parts of the same specification only.

With control systems provided with MOS modules, use parts of the same specification only.

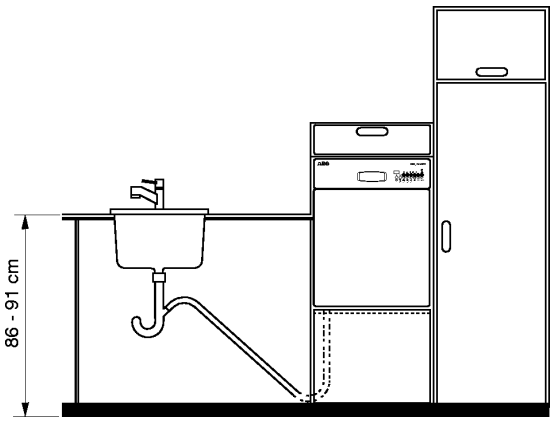
Observe all MOS regulations when handling MOS components

Only carry out mechanical repairs or checks of mechanical components when these are dead.

1. Installation/Built-in 60 cm and 55 cm

1.1 General

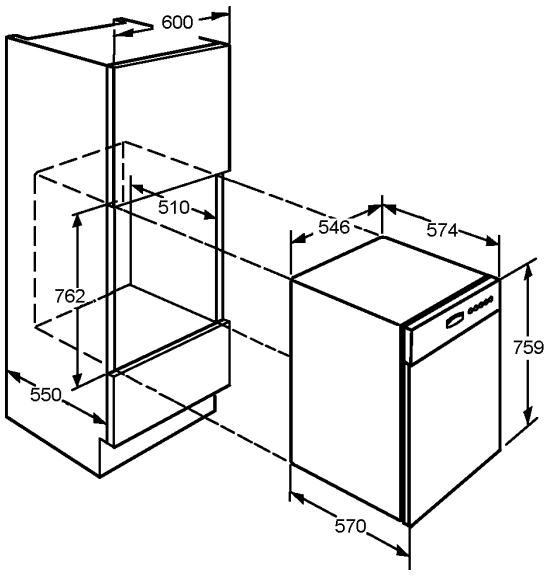
- The dishwasher is supplied ready for installation, i.e. with power cable, discharge hose and admission hose with incorporated sieve and sealing.
- Installation is at the connections provided for this purpose in the adjacent cupboard (not directly behind the appliance !).
- Observe the regulations of the local waterworks and electrical power supply facilities !
- Do not lay down the appliance! The built-in water softener contains water which could drain off.



1.2 Water installation

Inlet :

- You can connect the appliance to both cold and hot water (max. 50 °C).
- Water pressure: 1 to 10 bars
- A shut-off control element of connection ¾" should be provided by the Customer.
- The inlet hose consists of high-quality plastic with approved compressive and buckling resistance. A sieve is incorporated on the connection side to eliminate contamination from the supply network, as well as a rubber seal.
- When making the connection, take care that sieve and seal are in their correct positions.
- After opening the shut-off control, no water is allowed to leak from the threaded joint !
- With hot water connection in particular, slightly retighten the screwed joint after some minutes of operation (do not use force) once the connection has sufficiently heated up.



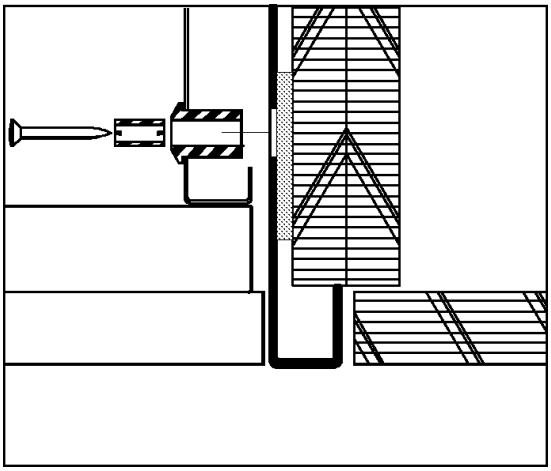
Drain:

- Install the flexible drainage hose without buckles.
- Installation is at the drain trap of the sink drain pipe installed in the adjacent cupboard.
- The appliance is provided with a non-return device which allows for installation height of the appliance even above drain trap level.
- The highest point of the drainage hose may never exceed the overall height of the appliance.

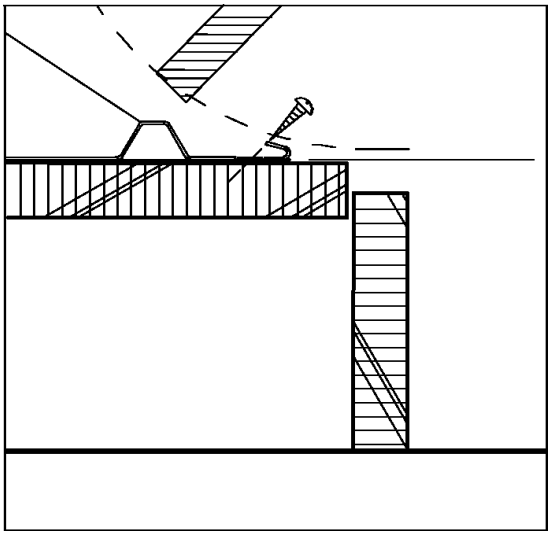
Installation :

- Adhere humidity protection foil according to instructions mentioned on reverse of foil (cut to length if necessary).
- Install side ledges to cupboard sidewalls according to separate installation instructions.
- Place appliance in front of upright cupboard, draw cables and hoses through upright cupboard niche across base area towards adjacent cupboard. Push the appliance into the niche, while continuously draw along the cables and hoses to prevent these from being squeezed or buckled.
- Align the dishwasher to centreline of the niche and flush with the side ledges by fitting in adjustment plates, if necessary.
- Carefully open appliance door to avoid changing the adjusted appliance. Fix appliance with screws through provided holes to the sidewalls of the piece of furniture on both sides in upper inner area (see Detail A).
  Before securing the dishwasher obliquely by two further screws through the floor plate (absolutely first drill holes!), it is advisable to protect the appliance door against damage by applying suitable material (such as the packaging cardboard). Open the door, for this fitting operation, by approx. 45 degrees (see Detail B).

Detail A

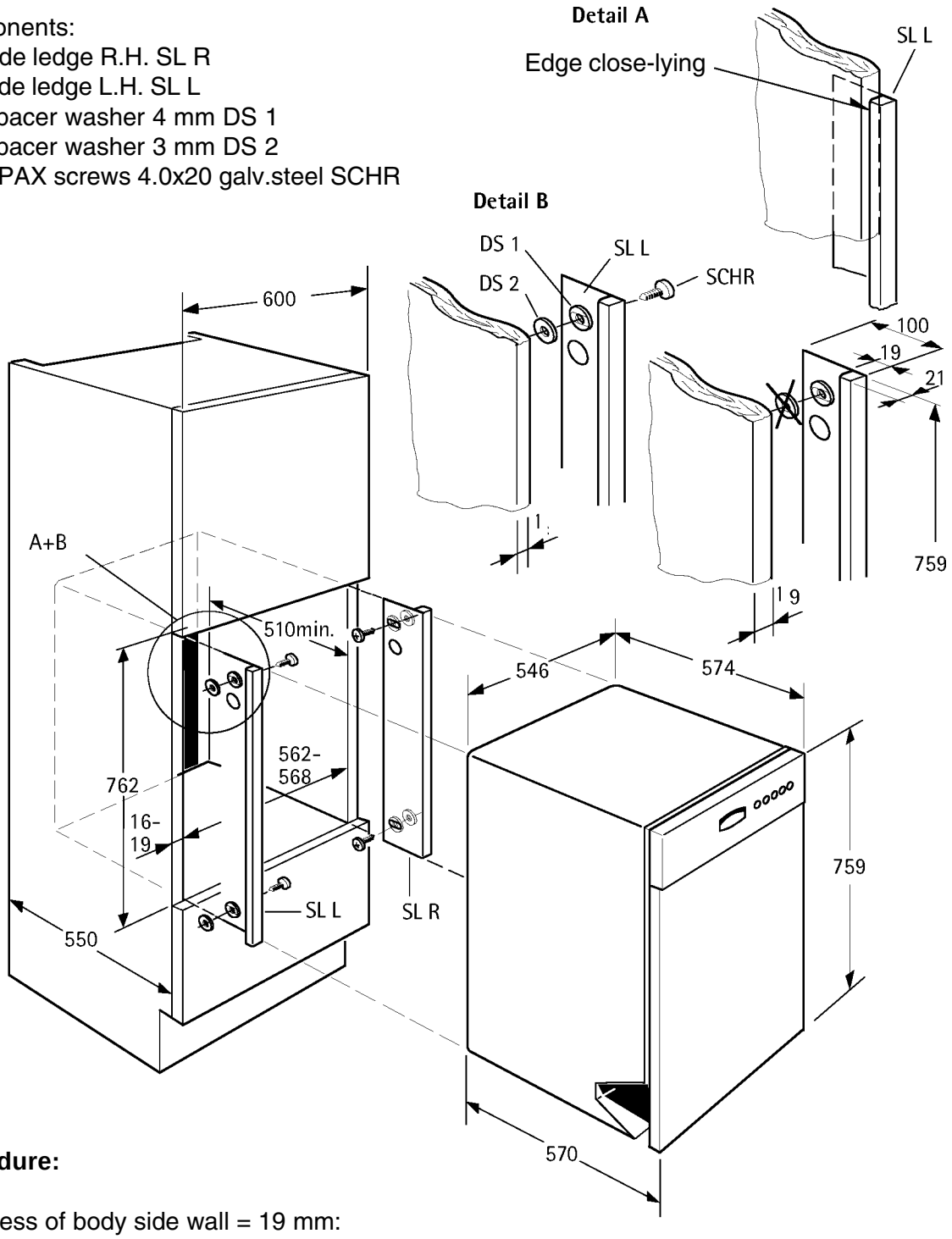


Detail B



1.3 Assembly instructions to installation kit side ledge

Components:
1 off side ledge R.H. SL R
1 off side ledge L.H. SL L
4 off spacer washer 4 mm DS 1
4 off spacer washer 3 mm DS 2
4 off SPAX screws 4.0x20 galv.steel SCHR



Procedure:

Thickness of body side wall = 19 mm:
- Remove protective strip of the 2 spacer washers (DS 1) mounted to the side ledges (SL R + SL L).
- Position side ledge (SL L): > Base surface (open) close-lying to niche base.
  > Edge close-lying to body side wall (according to Detail A)
- Press on and fix in its position the side ledge (SL L), secure with the supplied screws 2 off (SCHR).
- Repeat the procedure with side ledge (SL R).

Thickness of body side wall = 16 mm:
- Remove protective strip of the 2 spacer washers (DS 1) mounted to the side ledges (SL R + SL L).
- Adhere the spacer washers 3 mm (DS 2) supplied loosely, according to Detail B, with cover from the left, on to the pre-assembled spacer washers 4 mm (DS 1).
- It is important that the adhesive strip of spacer washer 3 mm (DS 2) is situated on the outside.
- Further procedure according to instructions for body side wall thickness 19 mm.

1.4 Built-in 55 cm

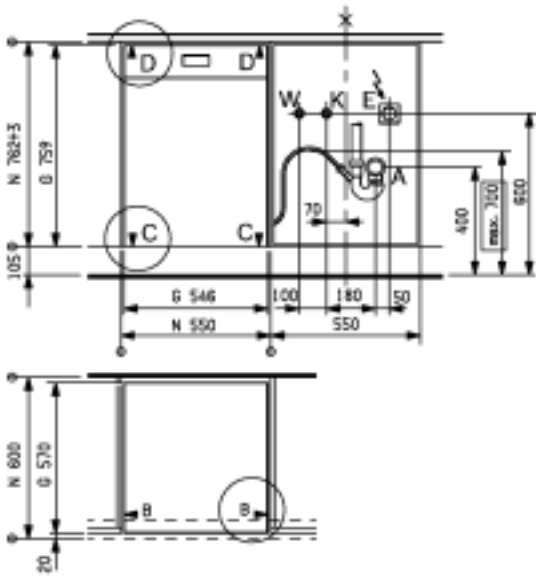
1.4.1 Substructure

Dishwashers GS 24 (lower and medium comfort level) G 4 5x / G4 6x

General

- The dishwasher is supplied ready for installation, i.e. with power cable, mounted discharge hose and admission hose with sieve.
- The dishwasher may be built into niches made of combustible material without additional safety measures.
- Provide water tap and socket as indicated in the drawing opposite.
- Always observe the regulations of the local waterworks and electrical power supply facilities!

Do not lay down the appliance! The built-in water softener contains water which could drain off.



A = Drain
G = Appliance dimensions
K = Cold water connection
N = Niche dimensions
W = Hot water connection
E = Socket

Water installation

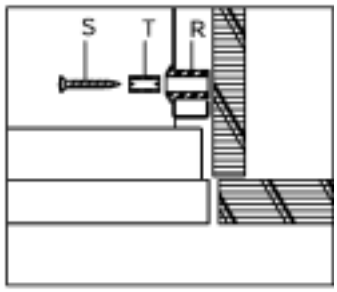
Inlet
- You may connect the appliance to both cold and hot water (max. 65 °C).
- Water pressure: 1 to 10 bars (flow pressure)
- A regulating tap of outgoing connection G ¾" should be provided by the Customer.
- The inlet hose is a plastic compression hose with sieve, SVGW approved 25 bars.
- It is recommended to install an IRG filter.

Drainage:
- Install the flexible drainage hose of an inner diameter of 22 mm without buckles.
- The drainage of the appliance is provided with an Aqua-Stop system so that connection fittings with anti-reflux device are not required.
- The highest point of the drainage hose may never exceed 700 mm above floor level.

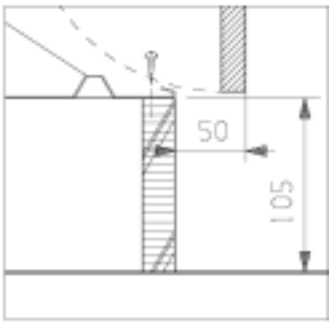
Installation

- Place appliance in front of the recess. Draw cables and hoses towards adjacent cupboard.
- Push the appliance in, while continuously drawing along the cables and hoses, ensuring to prevent these from being buckled.
- Align the dishwasher and secure it at both sides in the upper part of the washing compartment shell (Detail B).
- Optional fitting positions: At the base (Detail C). Optional accessories available: Additional lugs at the cover, PNC 153 04 02 00 (Detail D).

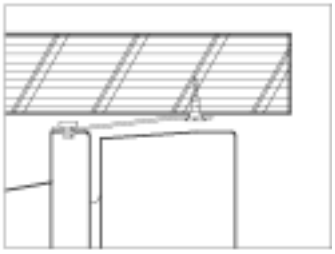
Detail B



Detail C



Detail D



Electrical connection

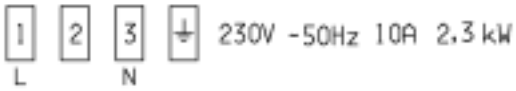
A licensed electrical fitter should install the connection to the mains!

- The appliance is provided with a power cable 3 x 1 mm2 with injection-moulded plug (type 13).
- You should connect the dishwasher to the mains by means of a plug, or an all-polo-switch of a minimum of 3mm contact distance should be provided within the fixed installation for isolation from the mains.

Installation on the part of the customer:

- Install fuse, feeder and socket according to the wiring schematic.

Circuit: Radiator voltage 230 V



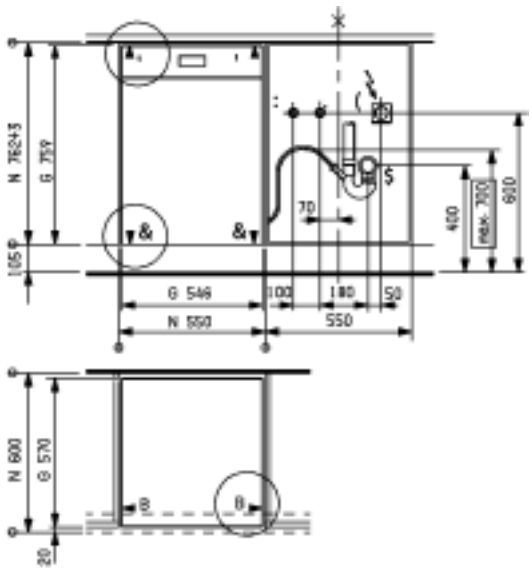
1.4.2 Substructure fully incorporated

Dishwashers GS 21, GS 22, G 1 and G 2 (without lowest comfort level, model with rotary-type control knob)

General

- The dishwasher is supplied ready for installation, i.e. with power cable (without plug), mounted draining hose and admission hose with sieve.
- The dishwasher may be built into niches made of combustible material without additional safety measures.
- Provide water tap and socket as indicated in the drawing opposite.
- Always observe the regulations of the local waterworks and electrical power supply facilities !

Do not lay down the appliance! The built-in water softener contains water which could drain off.



A = Drain
G = Appliance dimensions
K = Cold water connection
N = Niche dimensions
W = Hot water connection
E = Socket

Water installation

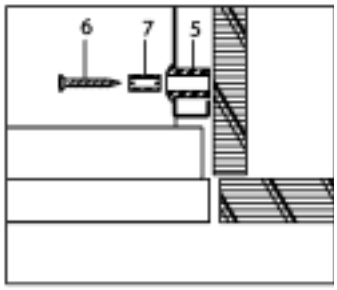
Inlet
- You may connect the appliance to both cold and hot water (max. 65 °C).
- Water pressure: 1 to 10 bars (flow pressure)
- A regulating tap of outgoing connection G ¾" should be provided by the Customer.
- The inlet hose is a plastic compression hose with sieve, SVGW approved 25 bars.
- It is recommended to install an IRG filter.

Drainage:
- Install the flexible drainage hose of an inner diameter of 22 mm without buckles.
- The drainage of the appliance is provided with an Aqua-Stop system so that connection fittings with anti-reflux device are not required.
- Connection is preferably at the drain trap of the sink drain pipe in the cupboard adjacent to the appliance.
- The highest point of the drainage hose must not exceed 700mm above floor level.

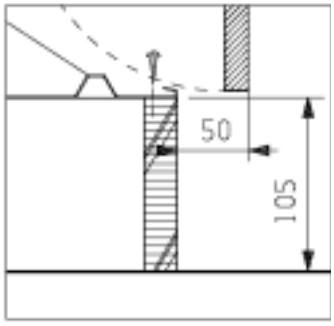
Installation

- Place appliance in front of the recess. Draw cables and hoses towards adjacent cupboard.
- Push the appliance in, while continuously drawing along the cables and hoses, ensuring to prevent these from being buckled.
- Align the dishwasher and secure it at both sides in the upper part of the washing compartment shell (Detail B).
- Optional fitting positions : At the base (Detail C). Optional accessories available : Additional lugs at the cover, PNC 153 04 02 00 (Detail D).

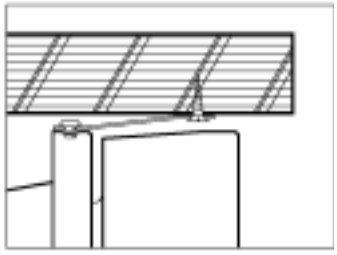
Detail B



Detail C



Detail D



Electrical connection

A licensed electrical fitter should install the connection to the mains !

- The appliance is provided with a power cable 3 x 1 mm2 with injection-moulded plug (type 13).
- You should connect the dishwasher to the mains by means of a plug, or an all-polo-switch of a minimum of 3mm contact distance should be provided within the fixed installation for isolation from the mains.

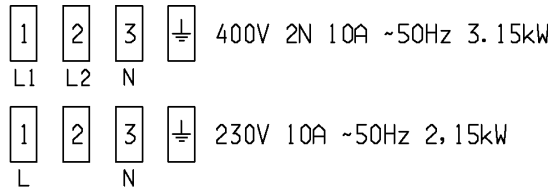
Installation on the part of the customer :

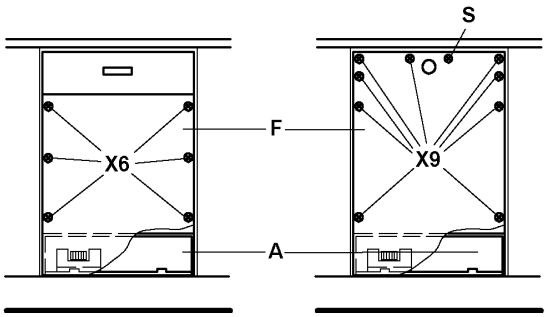
- Install fuse, feeder and socket according to the wiring schematic.
- Connect plug (supplied by Customer) according to instruction label on power cable.

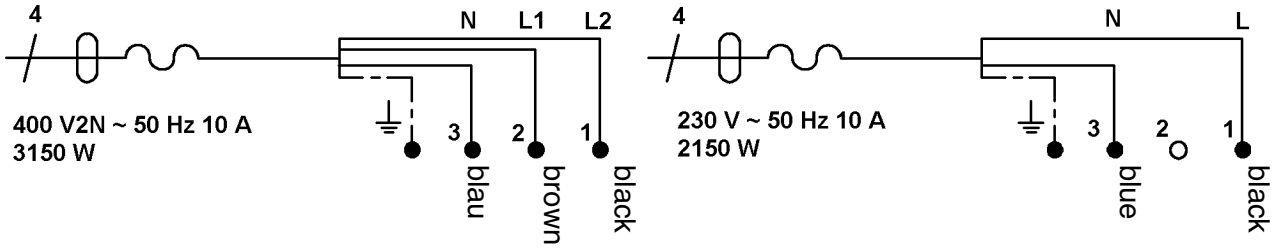
Switching over to 230 V 6 A, 15 kW
Should be carried out by a licensed electrical fitter!

- Isolate appliance from the mains.
- Unscrew front panel (F).
- With the non-incorporated dishwasher, remove all screws (X6),
- With incorporated and fully incorporated dishwashers with two-piece door panel, remove the 4 outer screws of X6 only.
- Attention: Do not remove screw (S).
- Unscrew lower cover (A) and disengage.
- Switching over according to connection schematic on the inner face of the servicing cover.

Circuit: Radiator voltage 230 V


1 2 3 ⏚ 400V 2N 10A ~50Hz 3.15kW
L1 L2 N
1 2 3 ⏚ 230V 10A ~50Hz 2,15kW
L N
1 2 3 ⏚ 230V 6A ~50Hz 1.15kW
L N
Only recommended for hot water connection.

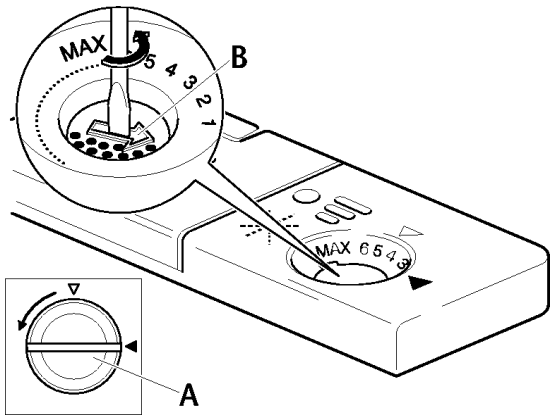




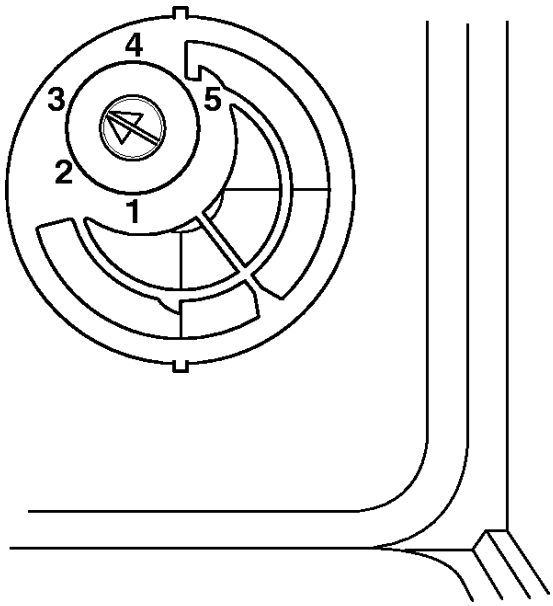
For switching over to 230 V, 1150 W, 6 A, refer to connection schematic on the inner face of the servicing cover. Plug schematic identical to 230 V, 2150 W, 10 A.

2. Setting the rinsing agent dosage

1. Open the dispenser by turning the cover cap (A) to the left.
2. In order to increase the dosing amount, turn the dosing arrow to the left by means of a coin or screwdriver. In the works, the setting has been to Position 3 (ideal setting is position 2 – 4).
3. Close the dispenser.



3. Setting the regenerating salt dosage



Regenerating salt dosage for water softening should be set to the respective water hardness degree. If you set the dosage too low, calcium stains will be left behind on the crockery and cutlery. Consult your competent waterworks for information about the water hardness and hardness range within your residential area.

With a water hardness below 5 dH, there is no need for filling any regenerating salt. In this incident, the salt display is constantly lit.

Set the amount of dosage as follows :
Turn the dosing knob by means of a coin or screwdriver until the arrow on the knob is directed to the desired number (1 to 5):

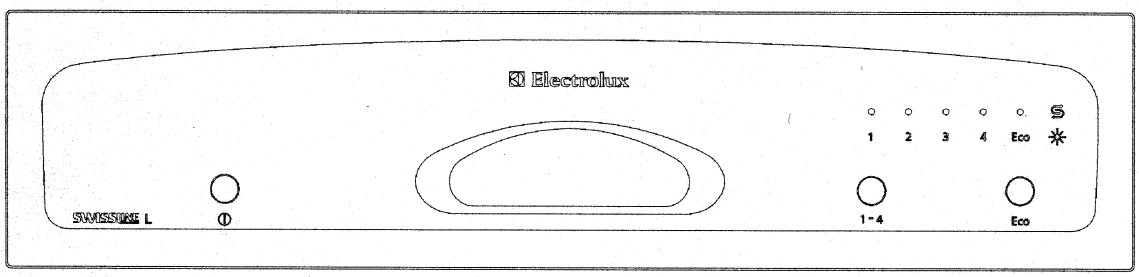
The arrow should be directed to a number, and the position should click into place.

Hardness range	Water hardness in dH	Position Rinsing cycles	Number
IV	> 28	5	10 15
	22 28	4	18 22
III	15 21	3	25 30
II	8 14	2	30 40
I	5 7	1	40 60
	< 5	1 No salt required	

4. Functional descriptions of GS 23 electronic system(s)

4.1 Overview of electronics used in this series

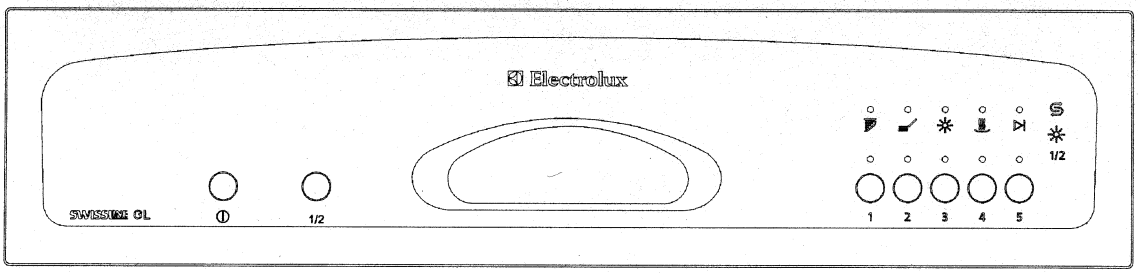
Comfort levels L.1/Li.1/GSA.2/GSIA.2
2-Key Electronic PNC 153 0259-04/1



1 = Normal
2 = Intensive
3 = Short
4 = Rinsing

Internal designation: TES 402/153 0841 00
2 red LEDs (salt and rinsing agent)
5 green LEDs for all programmes and Eco
No programme sequence indicator available
4 programmes : normal/intensive/short/pre-rinse
1 additional function : Eco
2 incorporated Pretests

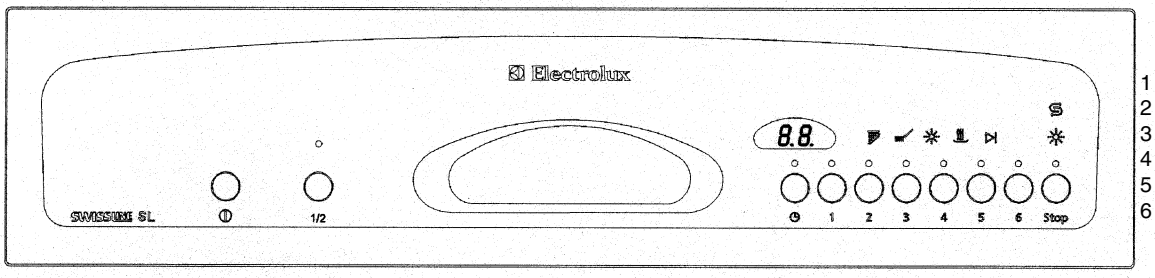
Comfort levels GL.1/Gli.1/GSB.2/GSIB.2
5-Key Electronic / PNC 153 0259-05/8



1 = Normal
2 = Intensive
3 = Short
4 = Pre-rinse
5 = Eco

Internal designation: TES 401/153 0842 00
2 red LEDs (salt and shine agent)
5 green LEDs for all programmes, Eco and Half-load
5 yellow LEDs as programme sequence indicator
4 programmes : normal/intensive/short/pre-rinse
2 additional functions : Eco / half-load
2 incorporated Pretests

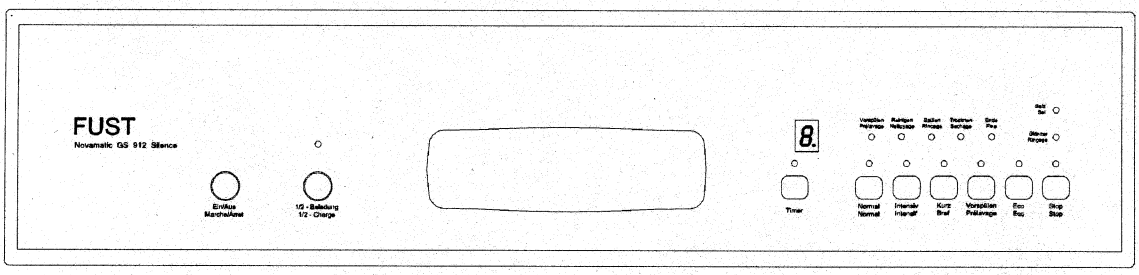
Niveaux de confort SL.1/Sli.1/GSG.2/GSIG.2
8-Key Electronic / PNC 153 0259-06/6



1 = Glasses
2 = Normal
3 = Intensive
4 = Short
5 = Pre-rinse
6 = Eco

Internal designation: TES 405/153 0843 00
2 red LEDs (salt and shine agent)
8 green LEDs for all programmes, Eco, Stop and Timer
5 yellow LEDs as programme sequence indicator
2 7-segment displays for start delay and remaining time
5 programmes : glasses/normal/intensive/short/pre-rinse
3 additional functions : Eco / half-load/start delay
2 incorporated Pretests

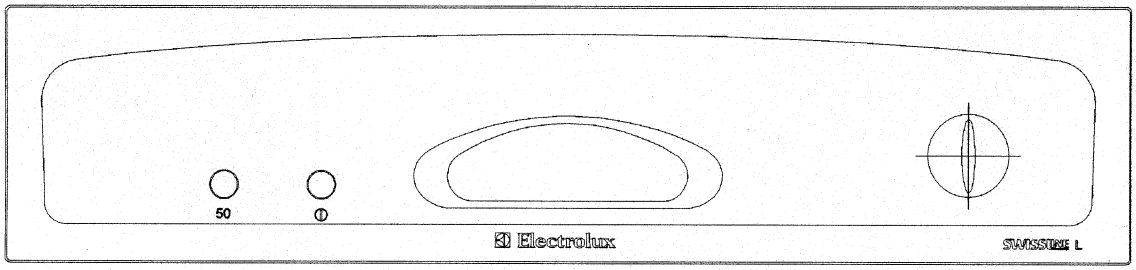
Comfort levels Fust GS 912
7-Key Electronic / PNC 153 0259-07/4



Internal designation: TES 407/153 0891 00
2 red LEDs (salt and shine agent)
7 green LEDs for all programmes, Eco and Stop
5 yellow LEDs as programme sequence indicator
1 7-segment display for start delay
4 programmes : normal/intensive/short/pre-rinse
3 additional functions : Eco / half-load/start delay
2 incorporated Pretests

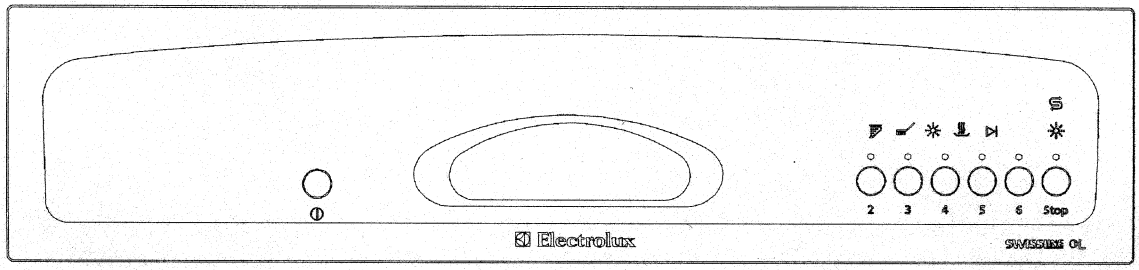
4.2 Comparison to the front panels of GS 22 generation

Comfort levels L/Li/GSA.1/GSIA.1
Mech. PGS / 153 0667-00/3



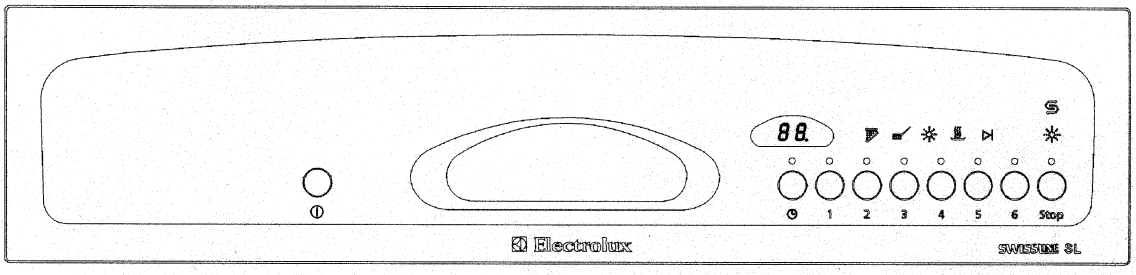
1 = Normal
2 = Intensive
3 = Short
4 = Pre-rinse

Comfort levels GL/Gli/GSB.1/GSIB.1
6-Key Electronic / ET 153 0259-02/5



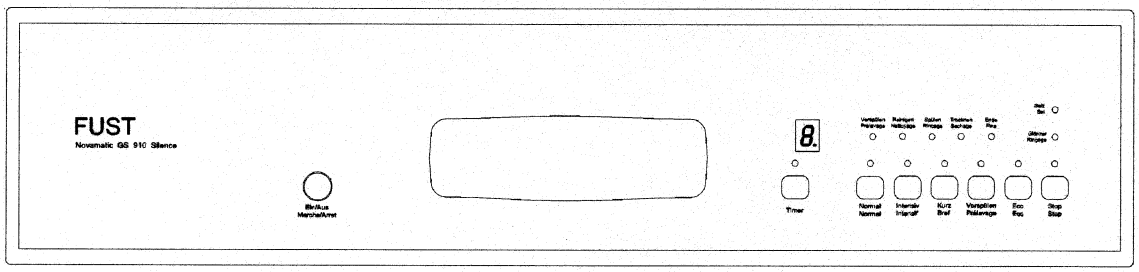
1 = Normal
2 = Intensive
3 = Short
4 = Pre-rinse
5 = Eco

Comfort levels SL/Sli/GSG.1/GSIG.1
8-Key Electronic / ET 153 0259-01/7



1 = Glasses
2 = Normal
3 = Intensive
4 = Short
5 = Pre-rinse
6 = Eco

Comfort levels Fust GS 912
7-Key Electronic / ET 153 0259-03/3



4.3 Structure (technical) and new functions

2 and 5 key Electronics

- Completely new electronics
- Snap-on case
- Single-board solution in SMD technology
- Fibre optic between LED display and top of case, snapped into the case from the front
- Mechanical ram, incorporated in the case cover, for transmission of input commands from rubber keypad to the pushbuttons
- High-resistance signal inputs
- Network inputs secured by VDR
- All consumers Triac controlled
- Pump capacity limited to 120VA by fixed phase angle (half-load and/or AAA)
- Temperature range from 0 to 60 °C
- Humidity range from 35 to 85 rel%

8 and 7 Key Electronics

- Derived from the 8 and 7 Key Electronic of series GS 22
- Snap-on case
- Two-board solution in conventional technology (wired elements)
- LED direct through case surface
- Direct input of commands from rubber keypad to pushbuttons
- High-resistance signal inputs
- Network inputs secured by VDR
- All consumers Triac controlled
- Pump capacity limited to 120VA by fixed phase angle (half-load and/or AAA)
- Temperature range from 0 to 60 °C
- Humidity range from 35 to 85 rel%

Novelty for all electronics :

Normal + Eco: Resolute optimisation of wash processes (wash time, temperatures, reduced pump capacity during rinsing etc., refer to programme sequence 8.2) has resulted in obtaining Energy Label AAA with this programme. But this also brings about enormously increased washing time.

Novelty for 5-key, 8-key et 7-key electronics only:

Half-load : By reducing the pump capacity (from 140 VA to 120 VA), the pressure in the system can be reduced and washing is with less water. This best functions with the newly designed spray arms (center and bottom).
Half-load and Eco : This combination exactly corresponds to the half-load function.

Novelty for 8-key electronics only :

Remaining washing time : Due to reprogramming, during washing, minute by minute in real time can now be counted back. Correction from average value is always at the end of a heating cycle.

4.4 Error codes

The electronic system can recognize and display possible errors by itself. Respective error displays flash at twice the speed as with normal input.

Comfort levels L.1/Li.1/GSA.2/GSIA.2
2-Key Electronic / PNC 153 0259-04/1

One of the green programme LEDs among the listed ones is fast flashing. A total of 5 faults are on display.

Comfort levels GL.1/Gli.1/GSB.2/GSIB.2
5-Key Electronic / PNC 153 0259-05/8

The yellow END LED together with one of the green programme LEDs among the listed ones are flashing. A total of 5 faults are on display.

Comfort levels SL.1/Sli.1/GSG.2/GSIG.2 Comfort levels Fust GS 912
8-Key Electronic / PNC 153 0259-06/6 7-Key Electronic / PNC 153 0259-07/4

A letter is displayed on the screen, and the yellow END LED together with one of the green programme LEDs among the listed ones are flashing. A total of 6 faults are on display (5 faults with 7-key electronic).

4.5 Error code displays

LED blinken								
Normal	Intensiv	Kurz	Absp len	Eco	Ende	Display	Fehler	Ursachen
X					X	A	Maximale F llzeit von 105 sec berschritten, Niveau nicht erreicht	Wasserhahn geschlossen Einlaufventil defekt, verstopft Druckw chter defekt
	X				X	C	Maximale Abpumpzeit von 120 sec berschritten, R ckschaltniveau nicht erreicht	Ablaufpumpe defekt Grobsieb verschmutzt Ablaufschlauch geknickt, verstopft Druckw chter defekt
		X			X	E	Maximale Nachf llzeit von 45 sec oder maximal erlaubte Anzahl von 3 Nachf llen berschritten	Zulaufschlauch l t zu wenig Wasser durch Siebe verstopft Wasserdruck zu niedrig Verkalkungen im gesamten Wasserzulauf Maschine verliert Wasser Druckw chter, Druckw chterschlauch defekt / undicht
			X		X	H	Maximale Heizzeit von 45 min berschritten, Temperatur nicht erreicht	Heizung defekt Heizungsrelais defekt 80 C Sicherheitsthermostat unterbricht den Heizstromkreis bevor die Normaltemperatur erreicht ist
				X	X	L	NTC-F hler Kurzschlu /Unterbrechung	NTC-F hler defekt Verdrahtung f r NTC-F hler fehlerhaft
						E2	Nur bei 8-Tasten Elektronik f r 2 sec nach dem Einschalten sichtbar, Geschirrsp ler funktioniert	Elektronik defekt

Note:
The two former fault messages **P** and **U** are no longer used in these control systems.
P (short-circuit level switch) has been newly incorporated into message **C**.
U (pump/cond. break or short-circuit) is cancelled, since, due to phase control, current monitoring is no longer possible.

4.6 Pretest roundabout

Application:	**This Pretest was developed for check roundabout in the works. Only the components fill-in solenoid, recycling pump, heating and lye pump are controlled.**
Start:	Switch OFF main switch Close door The following key combinations are applicable for the following control systems: Press and hold 2 keys / PNC 153 0259-04/1: Eco (LED Eco and pre-rinse) 5 keys / PNC 153 0259-05/8: Eco and pre-rinse together 8 keys / PNC 153 0259-06/6 as well as 7 keys / PNC 153 0259-07/4: Stop and Eco together Switch ON main switch Hold the key(s) pressed for at least 5 sec (corresponding LEDs are flashing during this time) The display shows the lower circle of the number 8 and/or the corresponding LEDs are permanently lit The programme starts to run
Key Stop: Only 8-key / PNC 153 0259-06/6 and 7-key / PNC 153 0259-07/4	If you stop the programme by using the stop key, the green LED Stop and Eco will flash. Now you have to switch OFF and ON again the control system, or else no input is possible. Attention: There is water in the machine ! *If you start the pretest again - as described under Start - the water contained in the machine is not pumped off. Depending on the condition, the dishwasher now contains too much or too little water.*
Stop (main switch):	If you stop the programme by means of the main switch, you can immediately select a wash programme when switching ON again. *If you start the pretest again - as described under Start - the programme jumps directly to Step 5, first pumping the water off the trough (corresponding LEDs flashing at the end).* *Now you can restart the pretest - as described under Start.*
Sequence:	See attached sequence plan.

4.7 Pretest sequence roundabout

STEP		Duration	All LED's on	Filling	Draining	Main Pump	Heater + level 1	Dispenser	Regeneration	Action
1		3 sec	■							Check, if all LED's are working
2		75 sec		■						Fixed filling time of 75 sec
3		open				■	■			When level 1 is switched on, heating until water temp. has reached 60 C, otherwise main pump on only for 5 sec without heater
4		20 sec								Paused, LED flashing
5		45 sec			■					Fixed draining, DW is going to be emptied

4.8 Computer Pretest

Application:	**This Pretest was developed for the test bench in the works and can also be used in the field (best along with a transparent door). All electrical components in the machine are controlled.**
Start:	Switch OFF main switch Close door The following key combinations are applicable for the following control systems: Press and hold 2 keys / PNC 153 0259-04/1: Programme selection (LED Eco and intensive) 5 keys / PNC 153 0259-05/8: Eco and intensive 8 keys / PNC 153 0259-06/6 as well as 7 keys / PNC 153 0259-07/4: Stop and Short together Switch ON main switch Hold the key(s) pressed for at least 5 sec (corresponding LEDs are flashing during this time) The display shows the upper circle of the number 8 and/or the corresponding LEDs are permanently lit The programme starts to run
Key Stop: Only 8-key / PNC 153 0259-06/6 and 7-key / PNC 153 0259-07/4	If you stop the programme by using the stop key, the green LED Stop and Short will flash. Now you have to switch OFF and ON again the control system, or elese no input is possible. Attention: There is water in the machine ! *If you start the pretest again - as described under Start - the water contained in the machine is not pumped off. Depending on the condition, the dishwasher now contains too much or too little water.*
Stop (main switch):	If you stop the programme by means of the main switch, you can immediately select a wash programme when switching ON again. *If you start the pretest again - as described under Start - the programme jumps directly to Step 9, first pumping the water off the trough (corresponding LEDs flashing at the end).* *Now you can restart the pretest - as described under Start.*
Sequence:	See attached sequence plan.

4.9 Computer Pretest sequence

STEP		Duration		All LED's on	Filling	Draining	Main pump	Heater + level 1	Dispenser	Regeneration	Action
1		3 sec		■							Check, if all LED's are working
2		5 sec						■			Heater on if level 1 switched on, otherwise paused for 5 sec
3		60 sec			■						Fixed filling 60 sec
4		20 sec					■		■		Check of sprayarm (turning speed) and dispenser
5		5 sec								■	Check of regeneration valve
6		5 sec					■	■			Check of mains pump and heater, if level 1 is switched on
7		90 sec			■						Overfilling with max 90 sec
8											Automatic operating : Drain pump engaged if NIV 2 reached, external power off, push buttons remain pressed or Hand operating : Jumps directly from step 7 to step 9
9		50 sec				■					Fixed draining, DW is going to be emptied

4.10 Alle Waschprogramme

4.10.1 Gläserprogramm

STEP	FILLING	DRAINING	WASHING	HEATING	KDG	REGENERATION	DRYING	GLASSES	DISPLAY	GLASSES + ECO	DISPLAY	GLASSES + 1/2	DISPLAY	REMARK
1	■							15"	59	15"	48	15"	46	<P1>
2		■						20"	59	20"	48	20"	46	CP0
3	■							VL	58	VL	47	<VL	45	
4			■					-	-	-	-	-	-	
5			■	■				-	-	-	-	-	-	
6			■					-	-	-	-	-	-	
7		■						-	-	-	-	-	-	
8		■						-	-	-	-	-	-	
9	■							-	-	-	-	-	-	
10						■		-	-	-	-	-	-	
11					■			5"	57	5"	46	5"	44	ARD
12			■					60"	56	60"	46	60"	44	P,R
13			■	■				43	55	38	45	38	43	P,C,M
14			■					240"	44	240"	36	240"	36	P,M
15		■						P0	40	P0	32	P0	32	
16		■						10"	40	10"	32	10"	32	CP0
17	■							VL	39	VL	31	<VL	31	
18			■					120"	37	120"	30	120"	30	P,R,M
19		■						P0	35	P0	28	P0	28	
20		■						10"	35	10"	28	10"	28	CP0
21	■							VL	34	VL	27	<VL	27	
22			■	■				52	33	47	26	47	26	P,R,M
23			■		■			30"	20	30"	19	30"	17	P,R
24			■					5"	20	5"	19	5"	17	P,R
25			■		■			25"	20	25"	19	25"	17	P,R
26			■	■				62	19	57	18	57	16	P,R,M
27						■		120"	13	120"	13	120"	13	M
28		■				■		P0	11	P0	11	P0	11	
29		■				■		10"	11	10	11	10	11	
30							■	600"	10	600"	10	600"	10	M
31		■						10"	1	10"	1	10"	1	

Legend:

<P1>	Fixed filling time of max 15 sec or until NIV1 is switched on
CP0	Fixed draining time of max 20 sec, then test if NIV1 is switched off
P0	Draining by pump until NIV1 is switched off
VL	Fixed filling time of 60 sec
<VL	Fixed filling time of 50 sec
ARD	Disabling multiple control pulses KDG (Antirepeat Dispenser)
P	Reduction of pump capacity to 120 VA (half-load)
R	Refill function active (max 3 times for 15 sec each)
C	Test of NIV1 before heating is switched on
M	Minute-wise back-counting of remaining washing time

4.10.2 Normal programme

STEP	FILLING	DRAINING	WASHING	HEATING	KDG	REGENERATION	DRYING	NORMAL	DISPLAY	NORMAL+ECO AAA	DISPLAY	NORMAL+1/2	DISPLAY	REMARK
1	■							15"	70	-	-	-	-	<P1>
2		■						20"	70	-	-	-	-	CP0
3	■							VL	69	VLA	2,1	<VL	64	
4			■					300"	68	600"	2,1	300"	63	P,R,M
5			■	■				-	-	-		-	-	
6			■					-	-	-		-	-	
7		■						P0	63	P0	2,0	P0	58	
8		■						10"	63	10"	2,0	10"	58	CP0
9	■							VL	62	VLA	2,0	<VL	57	
10						■		-	-	120	2,0	-	-	
11					■			5"	61	5"	2,0	5"	56	ARD
12			■					60"	61	60"	1,5	60"	56	P,R
13			■	■				47	60	t=45	1,5	47	55	P,C,M
14			■					600"	48	T-t	1,4	600"	44	P,M
15		■						P0	38	P0	56	P0	34	
16		■						10"	38	10"	56	10"	34	CP0
17	■							VL	37	VLA	55	<VL	33	
18			■					180"	36	300"	54	180"	32	P,PA,R,M
19		■						P0	34	P0	49	P0	29	
20		■						10"	34	10"	49	10"	29	CP0
21	■							VL	33	<VL	48	<VL	28	
22			■	■				57	32	52	47	52	27	P,PA,R,M
23			■		■			30"	20	30"	38	30"	19	P,PA,R
24			■					5"	20	5"	38	5"	19	P,PA,R
25			■		■			25"	20	25"	38	25"	19	P,PA,R
26			■	■				65	19	65	37	62	18	P,PA,R,M
27						■		120"	13	-	-	120"	13	M
28		■				■		P0	11	P0	31	P0	11	
29		■				■		10"	11	10	31	10	11	
30							■	600"	10	1800"	30	600"	10	M
31		■						10"	1	10"	1	10"	1	

Legend:

<P1>	Fixed filling time of max 15 sec or until NIV1 is switched on
CP0	Fixed draining time of max 20 sec, then test if NIV1 is switched off
P0	Draining by pump until NIV1 is switched off
VL	Fixed filling time of 60 sec
<VL	Fixed filling time of 50 sec
VLA	Fixed filling time of 55 sec
ARD	Disabling multiple control pulses KDG (Antirepeat Dispenser)
P	Reduction of pump capacity to 120 VA (half-load) all programmes
PA	Reduction of pump capacity to 120 VA (half-load) in Normal+Eco programme
R	Refill function active (max 3 times for 15 sec each)
C	Test of NIV1 before heating is switched on
M	Minute-wise back-counting of remaining washing time
T	Maximum washing time 70 min
t=45°	Time until reaching temperature of 45°C

STEP	FILLING	DRAINING	WASHING	HEATING	KDG	REGENERATION	DRYING	INTENSIVE	DISPLAY	INTENSIVE+ECO	DISPLAY	INTENSIVE+1/2	DISPLAY	REMARKS
1	■							15"	86	15"	81	15"	75	<P1>
2		■						20"	86	20"	81	20"	75	CP0
3	■							VL	85	VL	80	<VL	74	
4			■					60"	83	60"	78	60"	73	P,R
5			■	■				45	82	40	77	40	72	P,C,M
6			■					120"	74	120"	69	120"	64	P,M
7		■						P0	72	P0	67	P0	62	
8		■						10"	72	10"	67	10"	62	CP0
9	■							VL	71	VL	66	<VL	61	
10						■		-	-	-	-	-	-	
11					■			5"	71	5"	66	5"	61	ARD
12			■					60"	69	60"	65	60"	60	P,R
13			■	■				65	68	60	64	60	59	P,C,M
14			■					780"	53	780"	51	780"	47	P,M
15		■						P0	40	P0	38	P0	34	
16		■						10"	40	10"	38	10"	34	CP0
17	■							VL	39	VL	37	<VL	33	
18			■					180"	37	180"	35	180"	32	P,R,M
19		■						P0	35	P0	33	P0	29	
20		■						10"	35	10"	33	10"	29	CP0
21	■							VL	34	VL	32	<VL	28	
22			■	■				60	32	55	30	55	27	P,R,M
23			■		■			30"	21	30"	20	30"	19	P,R
24			■					5"	21	5"	20	5"	19	P,R
25			■		■			25"	21	25"	20	25"	19	P,R
26			■	■				70	20	65	19	65	18	P,R,M
27						■		120"	13	120"	13	120"	13	M
28		■				■		P0	11	P0	11	P0	11	
29		■				■		10"	11	10	11	10	11	
30							■	600"	10	600"	10	600"	10	M
31		■						10"	1	10"	1	10"	1	

Legend:

<P1>	Fixed filling time of max 15 sec or until NIV1 is switched on
CP0	Fixed draining time of max 20 sec, then test if NIV1 is switched off
P0	Draining by pump until NIV1 is switched off
VL	Fixed filling time of 60 sec
<VL	Fixed filling time of 50 sec
ARD	Disabling multiple control pulses KDG (Antirepeat Dispenser)
P	Reduction of pump capacity to 120 VA (half-load)
R	Refill function active (max 3 times for 15 sec each)
C	Test of NIV1 before heating is switched on
M	Minute-wise back-counting of remaining washing time

4.10.4 Short programme

STEP	FILLING	DRAINING	WASHING	HEATING	KDG	REGENERATION	DRYING	SHORT	DISPLAY	SHORT + ECO	DISPLAY	SHORT + 1/2	DISPLAY	REMARKS
1	■							15"	44	15"	38	15"	34	<P1>
2		■						20"	44	20"	38	20"	34	CP0
3	■							VL	43	VL	37	<VL	34	
4			■					-		-		-		
5			■	■				-		-		-		
6			■					-		-		-		
7		■						-		-		-		
8		■						-		-		-		
9	■							-		-		-		
10						■		-		-		-		
11					■			5"	42	5"	36	5"	33	ARD
12			■					60"	42	60"	36	60"	33	P,R
13			■	■				43	41	38	35	38	32	P,C,M
14			■					120"	31	120"	27	120"	25	P,M
15		■						P0	29	P0	25	P0	23	
16		■						10"	29	10"	25	10"	23	CP0
17	■							VL	28	VL	24	<VL	23	
18			■					60"	27	60"	23	60"	22	P,R
19		■						P0	26	P0	22	P0	21	
20		■						10"	26	10"	22	10"	21	CP0
21	■							VL	25	VL	21	<VL	21	
22			■	■				57	24	52	20	52	20	P,R,M
23			■		■			30"	9	30"	9	30"	9	P,R
24			■					5"	9	5"	9	5"	9	P,R
25			■		■			25"	9	25"	9	25"	9	P,R
26			■	■				62	8	57	8	57	8	P,R,M
27						■		120"	5	120"	5	120"	5	M
28		■				■		P0	3	P0	3	P0	3	
29		■				■		10"	3	10"	3	10"	3	
30							■	120"	2	120"	2	120"	2	M
31		■						10"	1	10"	1	10"	1	

Legend:

<P1>	Fixed filling time of max 15 sec or until NIV1 is switched on
CP0	Fixed draining time of max 20 sec, then test if NIV1 is switched off
P0	Draining by pump until NIV1 is switched off
VL	Fixed filling time of 60 sec
<VL	Fixed filling time of 50 sec
ARD	Disabling multiple control pulses KDG (Antirepeat Dispenser)
P	Reduction of pump capacity to 120 VA (half-load)
R	Refill function active (max 3 times for 15 sec each)
C	Test of NIV1 before heating is switched on
M	Minute-wise back-counting of remaining washing time

4.10.5 Pre-rinse

STEP	FILLING	DRAINING	WASHING	HEATING	KDG	REGENERATION	DRYING	**PRE-RINSE**	**DISPLAY**	**REMARKS**
1	■							-	-	
2		■						-	-	
3	■							VL	5	
4			■					180"	4	R,M
5			■	■				-	-	
6			■					-	-	
7		■						P0	1	
8		■						10"	1	CP0
9	■									
10						■				
11					■					
12			■							
13			■	■						
14			■							
15		■								
16		■								
17	■									
18			■							
19		■								
20		■								
21	■									
22			■	■						
23			■		■					
24			■							
25			■		■					
26			■	■						
27						■				
28		■				■				
29		■				■				
30							■			
31		■								

Legend:

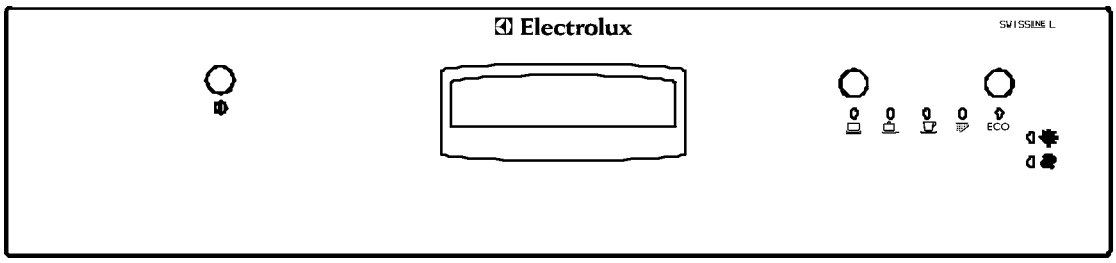
CP0	Fixed filling time of max 20 sec or until NIV1 is switched on
P0	Draining by pump until NIV1 is switched off
VL	Fixed filling time of 60 sec
R	Refill function active (max 3 times for 15 sec each)
M	Minute-wise back-counting of remaining washing time

5. Functional description of GS 24 electronic system(s)

5.1 Overview of the electronics used in this series

Comfort levels L.3/Li.3

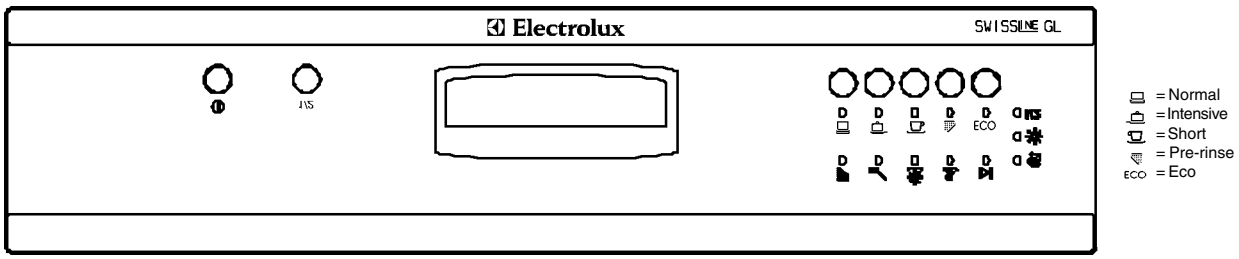
2-Key Electronic / PNC 153 0259-08/2



Internal designation : TES 502/153 0964 00
2 red LEDs (salt and shine agent)
5 green LEDs for all programmes and Eco
No programme sequence indicator
4 programmes : normal/intensive/short/pre-rinse
1 additional function : Eco
2 incorporated Pretests

Comfort levels GL.3/Gli.3

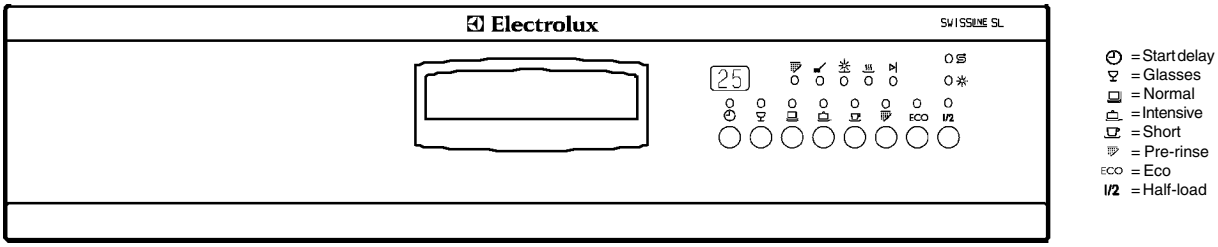
5-Key Electronic / PNC 153 0259-05/8



Internal designation : TES 401/153 0842 00
2 red LEDs (salt and shine agent)
6 green LEDs for all programmes, Eco and half-load
5 yellow LEDs as programme sequence indicator
4 programmes : normal/intensive/short/pre-rinse
2 additional functions : Eco and half-load
2 incorporated Pretests

Comfort levels SL.3/Sli.3

8-sensor electronic / PNC 153 0259-09/0



Internal designation : TES 505/153 0894 00
2 red LEDs (salt and shine agent)
8 green LEDs for all programmes, Eco, Stop and Timer
5 yellow LEDs as programme sequence indicator
2 7-segment displays for start delay and remaining washing time
5 programmes : glasses/normal/intensive/short/pre-rinse
3 additional functions : Eco / half-load/start delay
2 incorporated Pretests

Important Note :

All electronics supplied under GS 24 are already equipped with the latest software version F. This has been introduced in order to prevent the same programmes under series GS 23 and series GS 24 from being provided with different indexes.

5.2 Mechanical structure

Lowest comfort level:
Support panel made of plastic, design panel in varnished steel or stainless steel.
The design panel will be interlaced with the support panel.

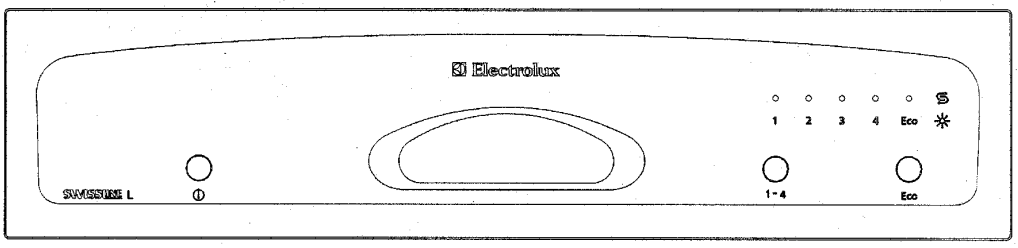
Medium comfort level:
Support panel made of plastic, design panel from glass, decorating strips of varnished steel or stainless steel, decorative rings around the keys.
All components are glued together, the decorative rings are snapped into the glass.

Highest comfort level:
Support panel made of plastic, design panel with sensor electronic on the rear side made of glass, decorating strips of varnished steel or stainless steel.
All components are glued together.

5.3 Comparison with front panels of generation GS 23

Comfort levels L.1/Li.1/GSA.2/GSIA.2

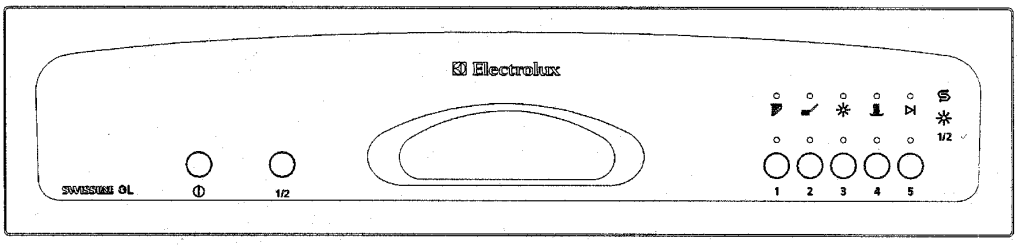
2-key Electronic / PNC 153 0259-04/1



1 = Normal
2 = Intensive
3 = Short
4 = Pre-rinse

Comfort levels GL.1/Gli.1/GSB.2/GSIB.2

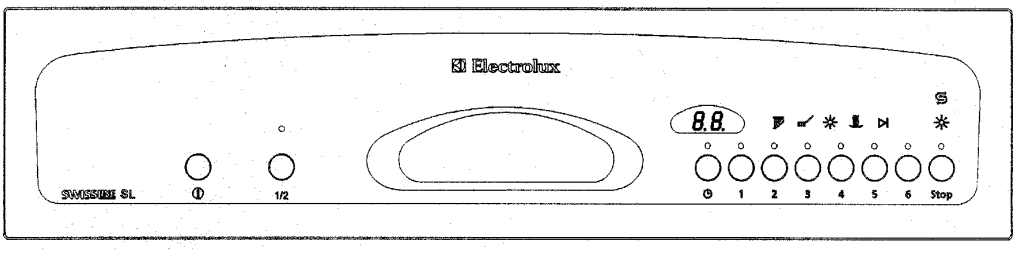
5-key Electronic / PNC 153 0259-05/8



1 = Normal
2 = Intensive
3 = Short
4 = Pre-rinse
5 = Eco

Comfort levels SL.1/Sli.1/GSG.2/GSIG.2

8-key Electronic / PNC 153 0259-06/6



1 = Glasses
2 = Normal
3 = Intensive
4 = Short
5 = Pre-rinse
6 = Eco

5.4 Structure (technical) and new functions

2-key and 5-key Électronic

- Électronic derived from series GS 23
- All keys/switches to operate from the front
- Snapped-on case
- Single-board solution in SMD technology
- Fibre optic between LED display and top of case, snapped into the case from the front
- Mechanical ram, incorporated in the case cover, for transmission of input commands
- Key caps slipped on new standard rubber keypad
- High-resistance signal inputs
- Network inputs secured by VDR
- All consumers Triac controlled
- Pump capacity limited to 120VA by fixed phase angle (half-load and/or AAA)
- Temperature range from 0 to 60 °C
- Humidity range from 35 to 85 rel%

8-sensor Électronic

- Derived from 8-key and 7-key electronic of series GS 23
- Main switch to operate in the panel from above
- Snap-on case
- Two-board solution in conventional technology (wired elements)
- LED direct through case surface
- Sensor fields with ground-in finger guide in the glass
- High-resistance signal inputs
- Network inputs secured by VDR
- All consumers Triac controlled
- Pump capacity limited to 120VA by fixed phase angle (half-load and AAA)
- Temperature range from 0 to 60 °C
- Humidity range from 35 to 85 rel%

Sensor Field Function

With the 8-sensor electronic, a second electronic system glued on to the glass back is assigned with the function of the mechanical keys. Each sensor field generates a constant minute electrical field extremely limited in space. If you approach your finger (or an object), this field is decreased in size. Such a decrease is recognized by the sensor electronic and evaluated. Connection from sensor electronic to the existing electronic is by means of a 10-pole low-tension wire within the panel.
The sensor electronic has a very simple structure and is insensitive against interference from outside ; in case of faults, however, it must be exchanged along with the panel since it is glued on it.
In the following, for clear overview, we refer to « Keys » only, even when referring to sensors with the highest comfort level.

Functions **Half-load** and **Normal + Eco (AAA),** as well as the existing pretests, have been taken over from the existing series GS 23 without any changes.

5.5 Error codes

The electronic system can detect and display possible errors by itself. The electronic system can recognize and display possible errors by itself. Respective error displays flash at twice the speed as with normal input.

Comfort level L.3/Li.3

2-Key Electronic / PNC 153 0259-08/2

One of the green programme LEDs among the listed ones is **fast** flashing. A total of 5 faults are on display.

Comfort levels GL.3/Gli.3

5-Key Electronic / PNC 153 0259-05/8

The yellow END LED together with one of the green programme LEDs among the listed ones are flashing. A total of 5 faults are on display.

Comfort levels SL.3/Sli.3

8-Key Electronic / PNC 153 0259-09/0

A letter is displayed on the screen, and the yellow END LED together with one of the green programme LEDs among the listed ones are flashing. A total of 6 faults are on display.

Code **A** and/or END LED and/or Normal are flashing:
- Maximum filling timme of 105 sec exceeded, before reaching the working level.

Possible causes:
Water tap closed
Fill-in solenoid in failure or clogged
Level switch faulty (at stop)

Code **C** and/or END LED and/or Intensive are flashing:
- Maximum drain time of 120 sec (20 sec in Step 2) exceeded without reaching reset level.

Possible causes:
Drain pump faulty/clogged
Drain hose or sieve clogged
Level switch faulty (short-circuit)

Code **E** and/or END LED and/or Short are flashing:
- Maximum refilling time of 45 sec or maximal permitted number of 3 refills exceeded.

Possible causes: Fill-in hose does not allow enough water to pass through,
Sieves clogged
Water pressure too low, water tap or
Regeneration dosage (inlet elbow) calcified
Appliance loses water

Code **H** and/or END LED and/or Pre-rinse are flashing:
- Maximum heating time of 45 min exceeded, operating temperature not reached.

Possible causes: heating damaged
heating relay damaged
80 °C safety thermostat disconnects the heating circuit too early or in irregular manner

Code **L** and/or END LED and/or Eco are flashing:
- Short-circuit or interruption at NTC temperature sensor.

Possible causes: NTC sensor damaged
wiring of NTC sensor damaged

Code **E2** (only displayed on 8-key electronic for 2 seconds after activation of main switch) :
- The appliance loses stored values in case of mains failure or when activating the main switch.

Cause: E2PROM in electronic system damaged

This fault has no influence on the dishwasher functioning.

Note:
The two former fault messages **P** and **U** are no longer used in these control systems.
P (short-circuit level switch) has been newly incorporated into message **C**.
U (pump/cond. break or short-circuit) is cancelled, since, due to phase control, current monitoring is no longer possible.

5.6 Pretest Roundabout

Application:	**This Pretest was developed for the test roundabout in the works. Only the components fill-in solenoid, recycling pump, heating and lye pump are controlled.**
Start:	Switch OFF main switch Close door The following key combinations are applicable for the following control systems: Press and hold 2 keys / PNC 153 0259-08/2: Eco (LED Eco and pre-rinse) 5 keys / PNC 153 0259-05/8: Eco and pre-rinse together 8 keys / PNC 153 0259-09/0: Half-load and Eco together Switch ON main switch Hold the key(s) pressed for at least 5 sec (corresponding LEDs are flashing during this time) The display shows the lower circle of the number 8 and/or the corresponding LEDs are permanently lit The programme starts to run
Stop (main switch):	If you stop the programme by means of the main switch, you can immediately select a wash programme when switching ON again. *If you start the pretest again - as described under Start - the programme jumps directly to Step 5, first pumping the water off the trough (corresponding LEDs flashing at the end).* *Now you can restart the pretest - as described under Start.*
Sequence:	See attached sequence plan.

5.6.1 Pretest sequence roundabout

STEP		Duration	All LED's on	Filling	Draining	Main Pump	Heater + level 1	Dispenser	Regeneration	Action
1		3 sec	■							Check, if all LED's are working
2		75 sec		■						Fixed filling time of 75 sec
3		open				■	■			When level 1 is switched on, heating until water temp. has reached 60 C, otherwise main pump on only for 120 sec without heater
4		20 sec								Paused, LED flashing
5		45 sec			■					Fixed draining, DW is going to be emptied

Application:	**This Pretest was developed for the test bench in the works and can also be used in the field (best along with a transparent door). All electrical components in the machine are controlled.**
Start:	Switch OFF main switch Close door The following key combinations are applicable for the following control systems: Press and hold 2 keys / PNC 153 0259-08/2: Programme selection (LED Eco and intensive) 5 keys / PNC 153 0259-05/8: Eco and intensive 8 keys / PNC 153 0259-09/0 Half-load and Short together Switch ON main switch Hold the key(s) pressed for at least 5 sec (corresponding LEDs are flashing during this time) The display shows the upper circle of the number 8 and/or the corresponding LEDs are permanently lit The programme starts to run
Stop (main switch):	If you stop the programme by means of the main switch, you can immediately select a wash programme when switching ON again. *If you start the pretest again - as described under Start - the programme jumps directly to Step 9, first pumping the water off the trough (corresponding LEDs flashing at the end).* *Now you can restart the pretest - as described under Start.*
Sequence:	See attached sequence plan.

5.7.1 Computer Pretest sequence

STEP		Duration		All LED's on	Filling	Draining	Main pump	Heater + level 1	Dispenser	Regeneration	Action
1		3 sec		■							Check, if all LED's are working (without 7segment display
2		5 sec						■			Heater on if level 1 switched on, otherwise paused for 5 sec)
3		60 sec			■						Fixed filling 60 sec
4		20 sec					■		■		Check of sprayarm (turning speed) and dispenser
5		5 sec								■	Check of regeneration valve
6		5 sec					■	■			Check of mains pump and heater, if level 1 is switched on
7		90 sec			■						Overfilling with max 90 sec
8											Automatic operating : Drain pump engaged if NIV 2 reached, external power off, push buttons remain pressed or Hand operating : Jumps directly from step 7 to step 9
9		50 sec				■					Fixed draining, DW is going to be emptied

5.8 All wash programmes

5.8.1 Glasses programme (Ver F)

STEP	FILLING	DRAINING	WASHING	HEATING	KDG	REGENERATION	DRYING	GLASSES	DISPLAY	GLASSES + ECO	DISPLAY	GLASSES + 1/2	DISPLAY	REMARK
1	■							15"	59	15"	48	15"	46	<P1>
2		■						20"	59	20"	48	20"	46	CP0
3	■							VL	58	VL	47	<VL	45	
4			■					-	-	-	-	-	-	
5			■	■				-	-	-	-	-	-	
6			■					-	-	-	-	-	-	
7		■						-	-	-	-	-	-	
8		■						-	-	-	-	-	-	
9	■							-	-	-	-	-	-	
10						■		-	-	-	-	-	-	
11					■			5"	57	5"	46	5"	44	ARD
12			■					60"	56	60"	46	60"	44	P,R
13			■	■				43 or 11'	55 55	38 or 9'	45 45	38 or 7'	43 43	P,C,M
14			■					240"	44	240"	36	240"	36	P,M
15		■						P0	40	P0	32	P0	32	
16		■						10"	40	10"	32	10"	32	CP0
17	■							VL	39	VL	31	<VL	31	
18			■					120"	37	120"	30	120"	30	P,R,M
19		■						P0	35	P0	28	P0	28	
20		■						10"	35	10"	28	10"	28	CP0
21	■							VL	34	VL	27	<VL	27	
22			■	■				52	33	47	26	47	26	P,R,M
23			■		■			30"	20	30"	19	30"	17	P,R
24			■					5"	20	5"	19	5"	17	P,R
25			■		■			25"	20	25"	19	25"	17	P,R
26			■	■				62	19	57	18	57	16	P,R,M
27						■		120"	13	120"	13	120"	13	M
28		■				■		P0	11	P0	11	P0	11	
29		■				■		10"	11	10	11	10	11	
30							■	600"	10	600"	10	600"	10	M
31		■						10"	1	10"	1	10"	1	

5.8.2 Normal programme (Ver F)

STEP	FILLING	DRAINING	WASHING	HEATING	KDG	REGENERATION	DRYING	NORMAL	DISPLAY	NORMAL + ECCO	DISPLAY	NORMAL+1/2	DISPLAY	REMARK
1	■							15"	70	-	-	-	-	<P1>
2		■						20"	70	-	-	-	-	CP0
3	■							VL	69	VLA	2,1	<VL	64	
4			■					300"	68	600"	2,1	300"	63	P,R,M
5			■	■				-	-	-		-	-	
6			■					-	-	-		-	-	
7		■						P0	63	P0	2,0	P0	58	
8		■						10"	63	10"	2,0	10"	58	CP0
9	■							VL	62	VLA	2,0	<VL	57	
10						■		-	-	120	2,0	-	-	
11					■			5"	61	5"	2,0	5"	56	ARD
12			■					60"	61	60"	1,5	60"	56	P,R
13			■	■				47	60	t=45	1,5	47	55	P,C,M
			■	■				or				or		
			■	■				12’	60	t=47	2,4	11’	55	
14			■					600"	48	T-t	1,4	600"	44	P,M
15		■						P0	38	P0	56	P0	34	
16		■						10"	38	10"	56	10"	34	CP0
17	■							VL	37	VLA	55	<VL	33	
18			■					180"	36	300"	54	180"	32	P,PA,R,M
19		■						P0	34	P0	49	P0	29	
20		■						10"	34	10"	49	10"	29	CP0
21	■							VL	33	<VL	48	<VL	28	
22			■	■				57	32	52	47	52	27	P,PA,R,M
23			■		■			30"	20	30"	38	30"	19	P,PA,R
24			■					5"	20	5"	38	5"	19	P,PA,R
25			■		■			25"	20	25"	38	25"	19	P,PA,R
26			■	■				65	19	65	37	62	18	P,PA,R,M
27						■		120"	13	-	-	120"	13	M
28		■				■		P0	11	P0	31	P0	11	
29		■				■		10"	11	10	31	10	11	
30							■	600"	10	1800"	30	600"	10	M
31		■						10"	1	10"	1	10"	1	

5.8.3 Intensive programme (Ver F)

FILLING	DRAINING	WASHING	HEATING	KDG	REGENERATION	DRYING	INTENSIVE	DISPLAY	INTENSIVE+ECO	DISPLAY	INTENSIVE+1/2	DISPLAY	REMARKS
■							15"	86	15"	81	15"	75	<P1>
	■						20"	86	20"	81	20"	75	CP0
■							VL	85	VL	80	<VL	74	
		■					60"	83	60"	78	60"	73	P,R
		■	■				45	82	40	77	40	72	P,C,M
		■	■				or		or		or		
		■	■				8'	82	8'	77	8'	72	
		■					120"	74	120"	69	120"	64	P,M
	■						P0	72	P0	67	P0	62	
	■						10"	72	10"	67	10"	62	CP0
■							VL	71	VL	66	<VL	61	
					■		-	-	-	-	-	-	
				■			5"	71	5"	66	5"	61	ARD
		■					60"	69	60"	65	60"	60	P,R
		■	■				65	68	60	64	60	59	P,C,M
		■	■				or		or		or		
		■	■				15'	68	13'	61	12'	59	
		■					780"	53	780"	51	780"	47	P,M
	■						P0	40	P0	38	P0	34	
	■						10"	40	10"	38	10"	34	CP0
■							VL	39	VL	37	<VL	33	
		■					180"	37	180"	35	180"	32	P,R,M
	■						P0	35	P0	33	P0	29	
	■						10"	35	10"	33	10"	29	CP0
■							VL	34	VL	32	<VL	28	
		■	■				60	32	55	30	55	27	P,R,M
		■		■			30"	21	30"	20	30"	19	P,R
		■					5"	21	5"	20	5"	19	P,R
		■		■			25"	21	25"	20	25"	19	P,R
		■	■				70	20	65	19	65	18	P,R,M
					■		120"	13	120"	13	120"	13	M
	■				■		P0	11	P0	11	P0	11	
	■				■		10"	11	10	11	10	11	
						■	600"	10	600"	10	600"	10	M
	■						10"	1	10"	1	10"	1	

STEP	FILLING	DRAINING	WASHING	HEATING	KDG	REGENERATION	DRYING	SHORT	DISPLAY	SHORT + ECO	DISPLAY	SHORT + 1/2	DISPLAY	REMARKS
1	■							15"	44	15"	38	15"	34	<P1>
2		■						20"	44	20"	38	20"	34	CP0
3	■							VL	43	VL	37	<VL	34	
4			■					-		-		-		
5			■	■				-		-		-		
6			■					-		-		-		
7		■						-		-		-		
8		■						-		-		-		
9	■							-		-		-		
10						■		-		-		-		
11					■			5"	42	5"	36	5"	33	ARD
12			■					60"	42	60"	36	60"	33	P,R
13			■	■				43 or 9'	41 39	38 or 7'	35 33	38 or 6'	32 30	P,C,M
14			■					120"	31	120"	27	120"	25	P,M
15		■						P0	29	P0	25	P0	23	
16		■						10"	29	10"	25	10"	23	CP0
17	■							VL	28	VL	24	<VL	23	
18			■					60"	27	60"	23	60"	22	P,R
19		■						P0	26	P0	22	P0	21	
20		■						10"	26	10"	22	10"	21	CP0
21	■							VL	25	VL	21	<VL	21	
22			■	■				57	24	52	20	52	20	P,R,M
23			■		■			30"	9	30"	9	30"	9	P,R
24			■					5"	9	5"	9	5"	9	P,R
25			■		■			25"	9	25"	9	25"	9	P,R
26			■	■				62	8	57	8	57	8	P,R,M
27						■		120"	5	120"	5	120"	5	M
28		■				■		P0	3	P0	3	P0	3	
29		■				■		10"	3	10"	3	10"	3	
30							■	120"	2	120"	2	120"	2	M
31		■						10"	1	10"	1	10"	1	

5.8.5 Pre-rinse (Ver F)

STEP	FILLING	DRAINING	WASHING	HEATING	KDG	REGENERATION	DRYING	**PRE-RINSE**	**DISPLAY**	**REMARKS**
1	■							-	-	
2		■						-	-	
3	■							VL	5	
4			■					180"	4	R,M
5			■	■				-	-	
6			■					-	-	
7		■						P0	1	
8		■						10"	1	CP0
9	■									
10						■				
11					■					
12			■							
13			■	■						
14			■							
15		■								
16		■								
17	■									
18			■							
19		■								
20		■								
21	■									
22			■	■						
23			■		■					
24			■							
25			■		■					
26			■	■						
27						■				
28		■				■				
29		■				■				
30							■			
31		■								

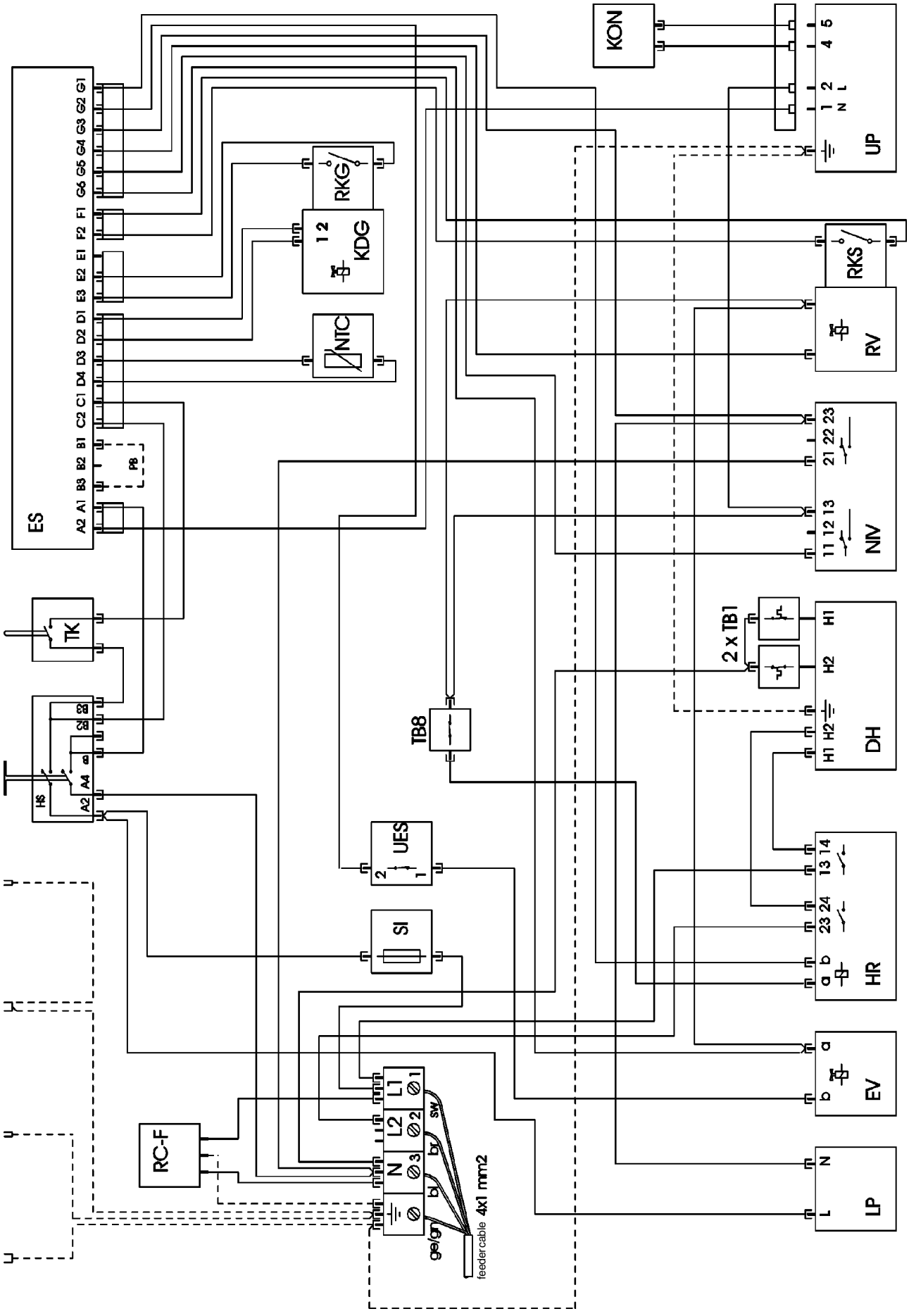
5.8.6 Legend for all programmes (Ver F)

Legend:

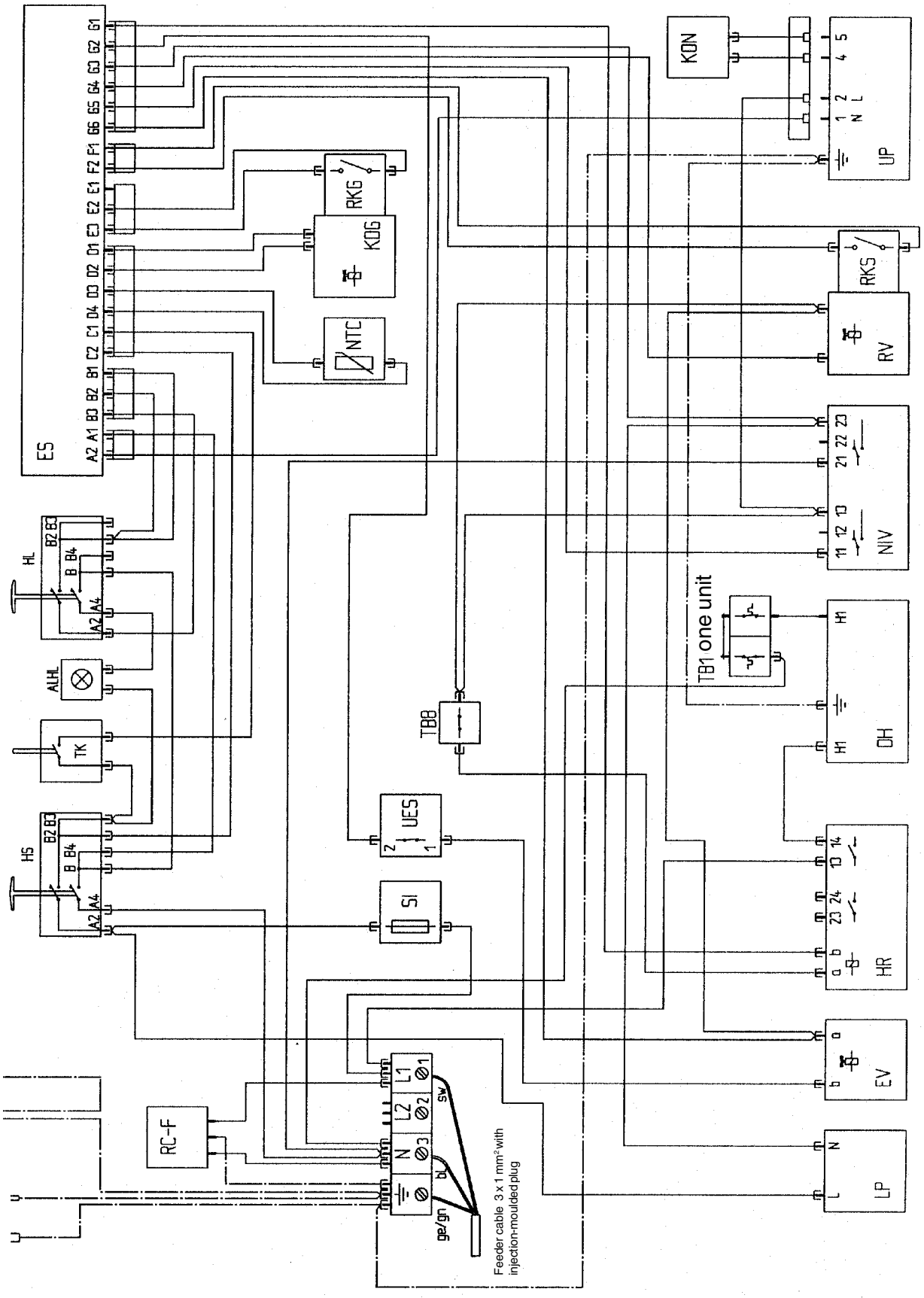
<P1>	Fixed filling time of max 15 sec
CP0	Fixed draining time of max 20 sec, then test if NIV1 is switched off
P0	Draining by pump until NIV1 is switched off
VL	Fixed filling time of 60 sec
VLB	Fixed filling time of 58 sec
VLA	Fixed filling time of 55 sec
VLX	Fixed filling time of 52 sec
<VL	Fixed filling time of 50 sec
ARD	Disabling multiple control pulses KDG (Antirepeat Dispenser)
P	Reduction of pump capacity to 120 VA (half-load)
R	Refill function active (max 3 times for 15 sec each)
C	Test of NIV1 before heating is switched on
M	Minute-wise back-counting of remaining washing time
T	Maximum washing time 70 min
t=45°	Time until reaching temperature of 47°C

6. Wiring Diagrams

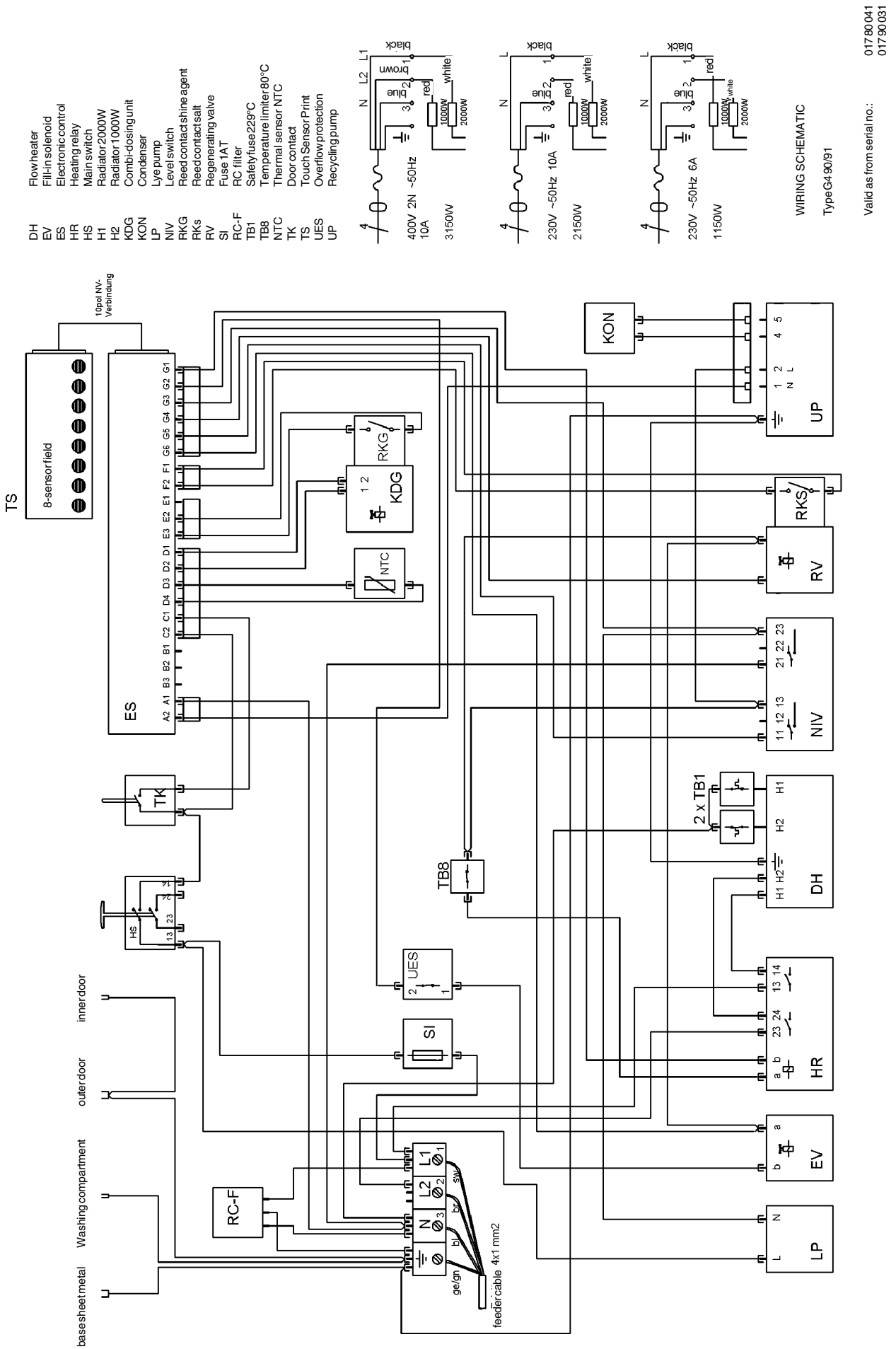
6.1 Example GS 23



Example GS 23



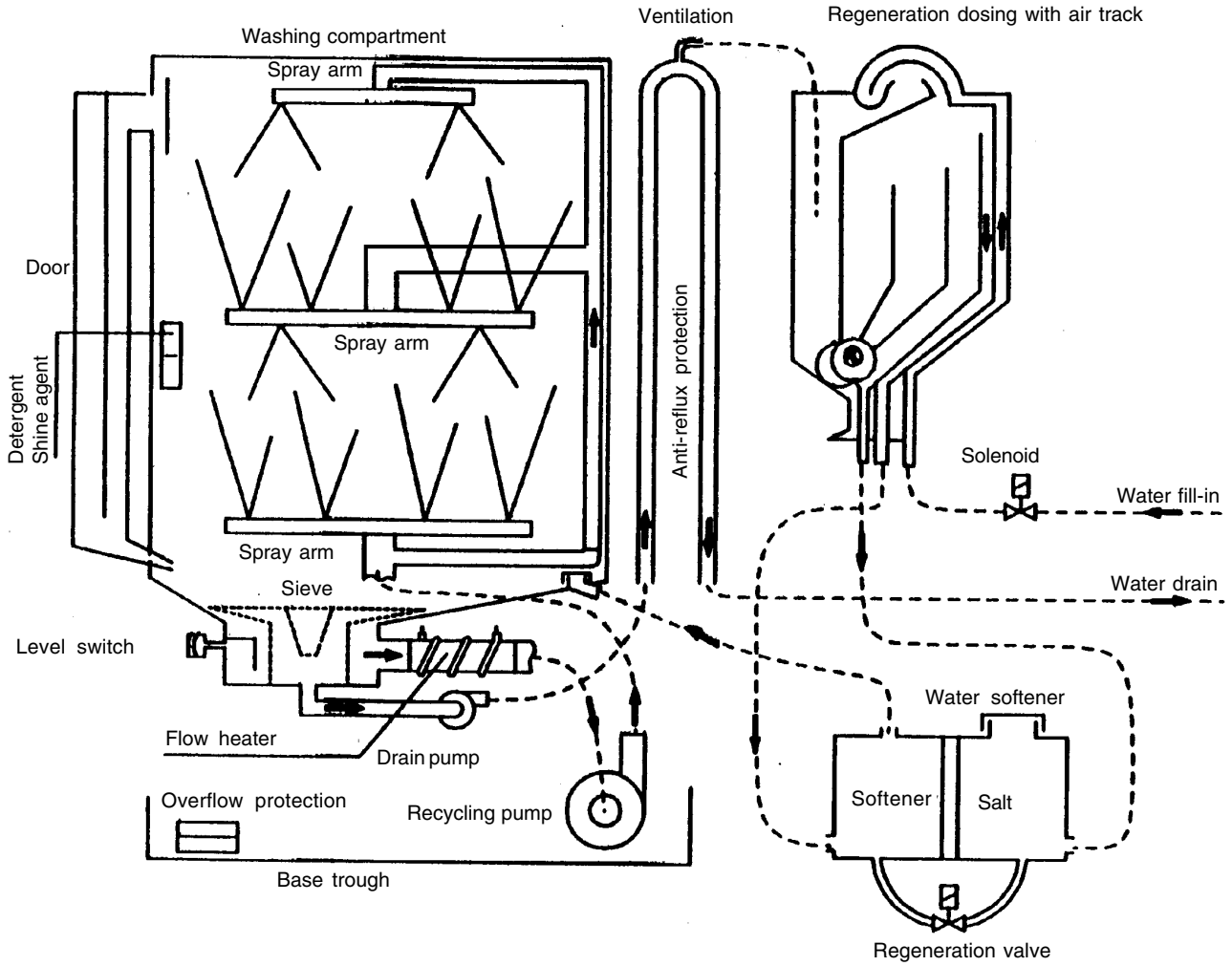
6.2 Exemple GS 24



7. Abbreviations

bl = blue ge = yellow gn = green br = brown schwe = black weiss = white AB = signal lamp AG AS DH = Heating H1 2000W H2 1000W EV = Water fill-in solenoid HS = Pushbutton switch KDG = Combi-Dosing Unit KON = Condenser LP = Drain pump MFV = Water-plus switch NIV = Pressostat PGS = Programme sequential circuit RG, = REED relay (rinsing agent) RUG RKG RS, = REED relay (salt) RKS RV = Regeneration valve	RC-F = Antiparasitic capacitor TB1 = Safety fuse 206/229 C TB1 = Safety thermostat 95 C TB8 = Safety thermostat 80 C T5 = Thermostat 48 C T6 = Thermostat 58 C TK = Door switch TM = PGS motor UES = Overflow protection switch UP = Recycling pump NTC = NTC sensor HR = Relay SI = Fuse 1AT ES = Input/output electronic PB = Programming bridge TS = Sensor field

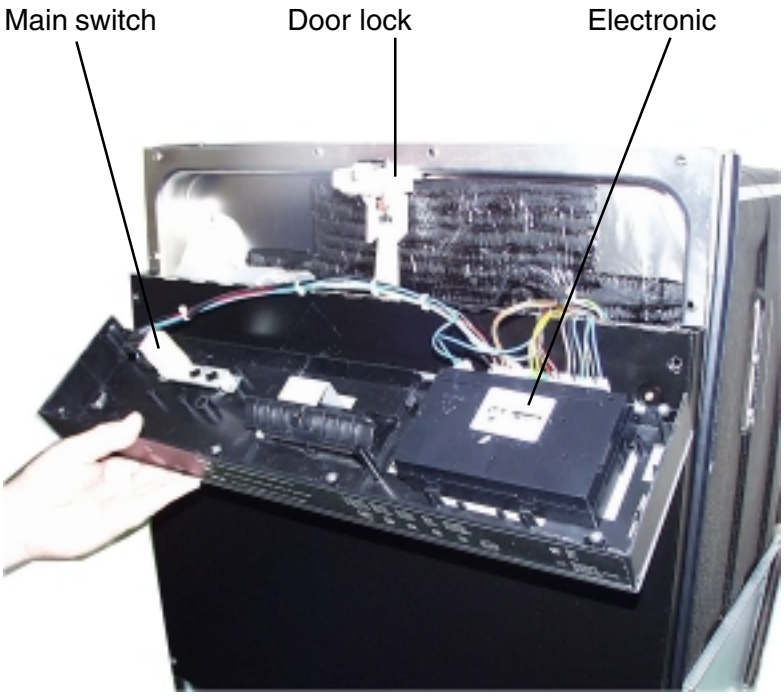
8. Water circuit schematic



9. Repair instructions

Remove the panel
Models operated from the front (face)

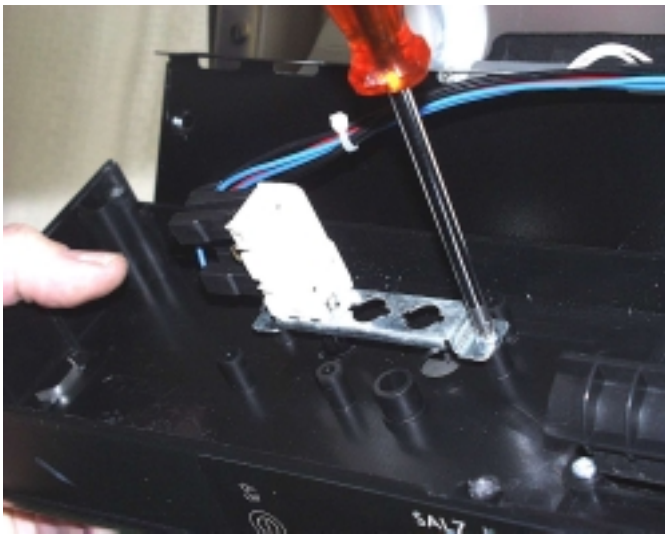
- Unscrew the six upper screws.
- Press the panel upwards by a small amount and take it off.



- Now you have easy access to door lock, main switch, and the electronic.

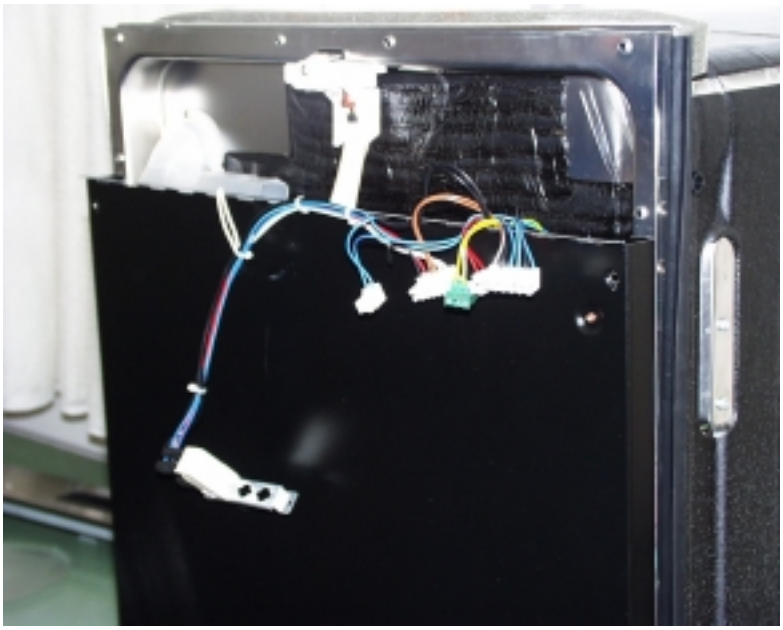
Remove the door sheet metal

To protect the panel from being damaged by scratches, you should completely dismantle it.

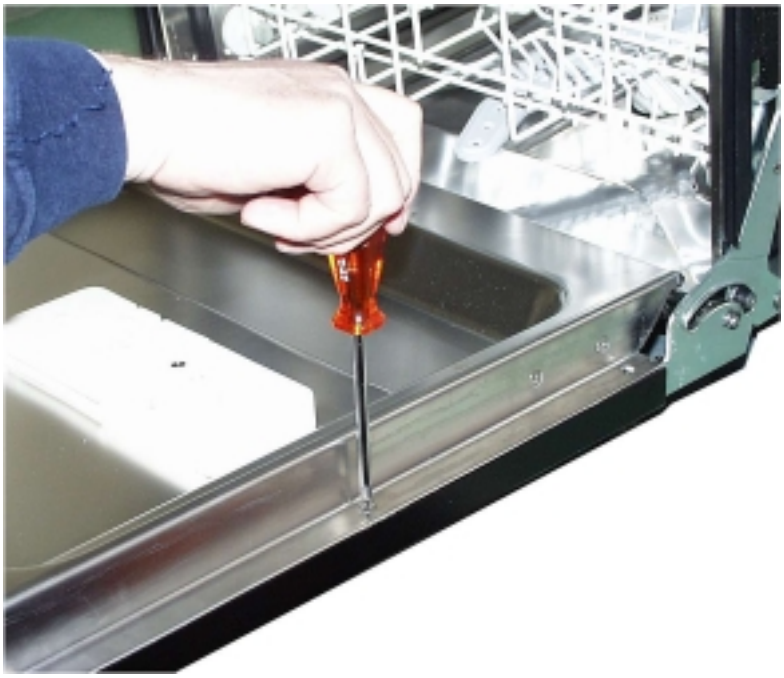


Unscrew the two fastening screws from the main switch.

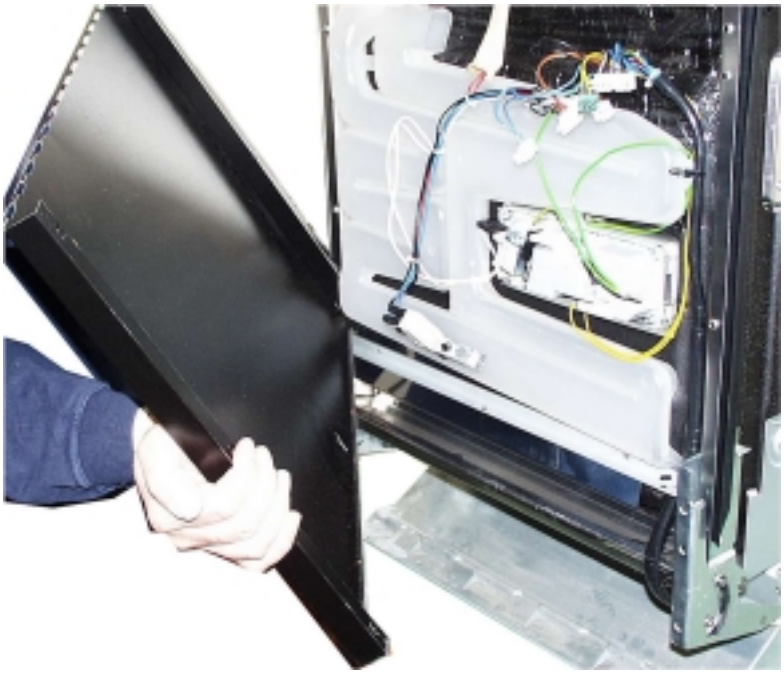
Mark position of the plug (which may be mixed up)



- Remove panel.
- Unscrew wooden decoration.



- Unscrew two fastening screws.



- Pull door sheet metal upwards out of hinge.
- Disconnect earth lead.

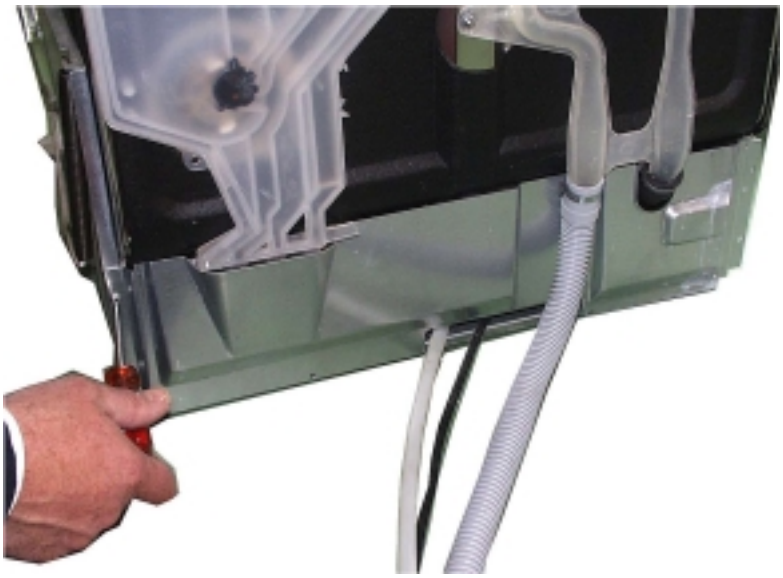
- Now you have easy access to the dosing device and to the condenser.

Dispenser

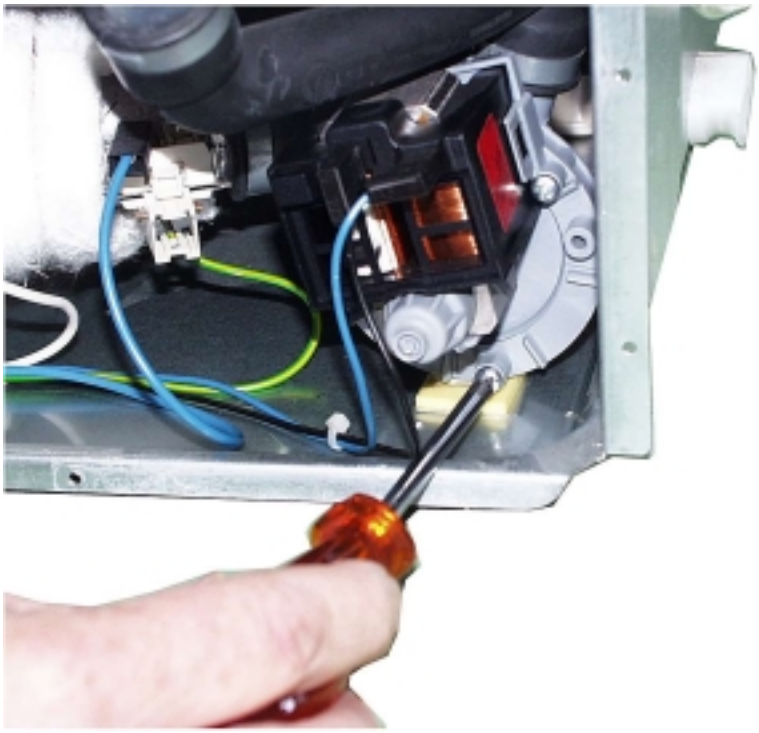
Recondensation

The condenser is used for condensing the humid air produced during drying.

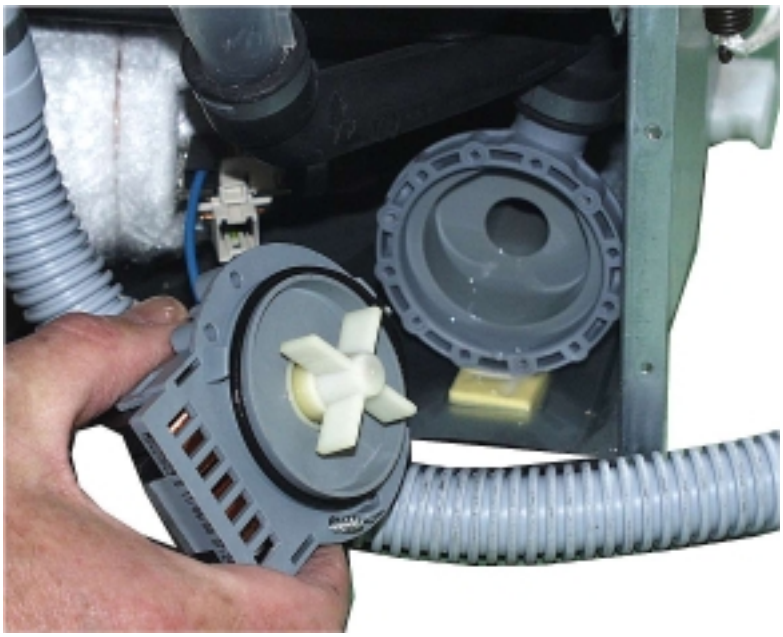
Drain pump, flow heater, recycling pump



- Unscrew rear base metal sheet.



- You can open and clean the drain pump after unscrewing the three screws.

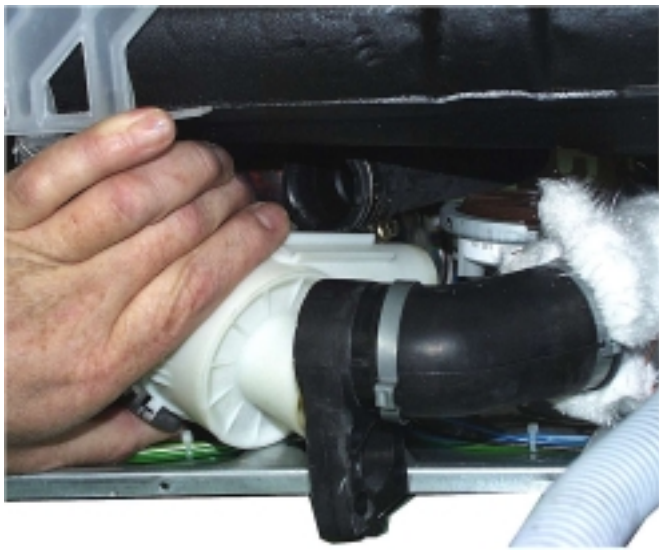


- Fitting position of recycling pump

Pull off the electrical connections.

- Cut open strap-type hose clamp.

- Unscrew the screwed clamp.
  Unlock pump support from base.
  Pull off hoses.



- Now you can take out the recycling pump.

Pump support

When mounting the recycling pump, note the following :

- You can re-use the strap-type hose clamp if you press it together with a diagonal cutting nipper.
  If you cannot re-use this clamp, use a new screwed clamp.

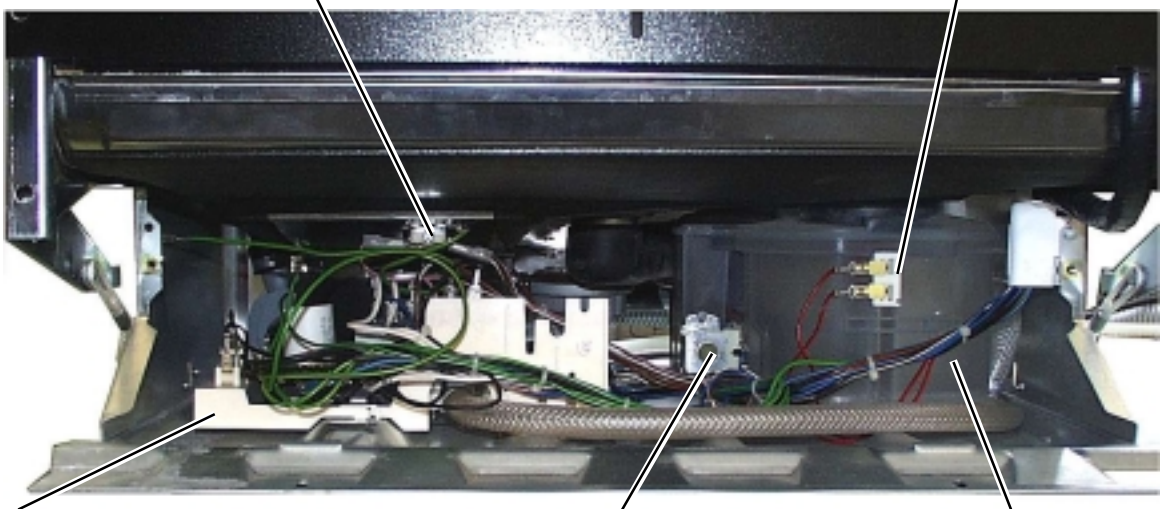
- Carefully install the rubber foot and the hose fixture.
- Dismantle the pre-door.

Thermostats, regeneration valve

- Unscrew the two fastening screws and remove the lower part of the front base plate.

Thermostat and the NTC sensor behind it

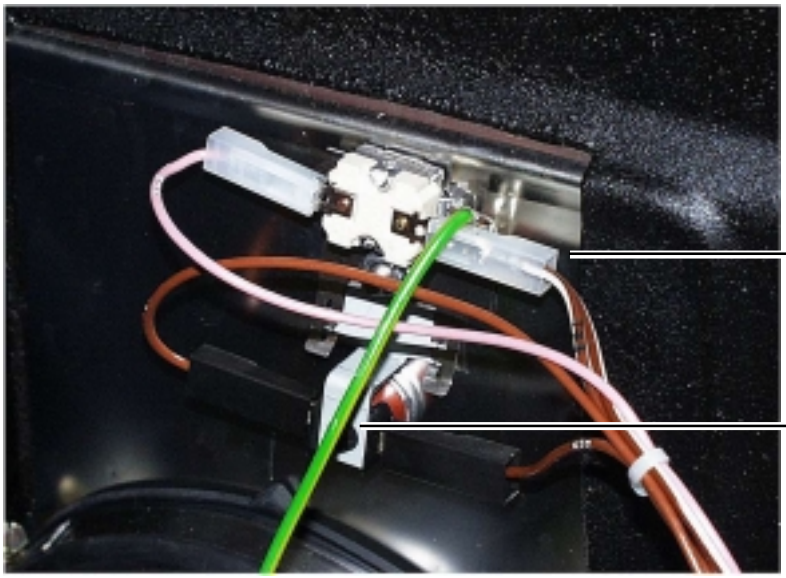
REED Relay salt indication



Retainer for electrical components

Regeneration valve

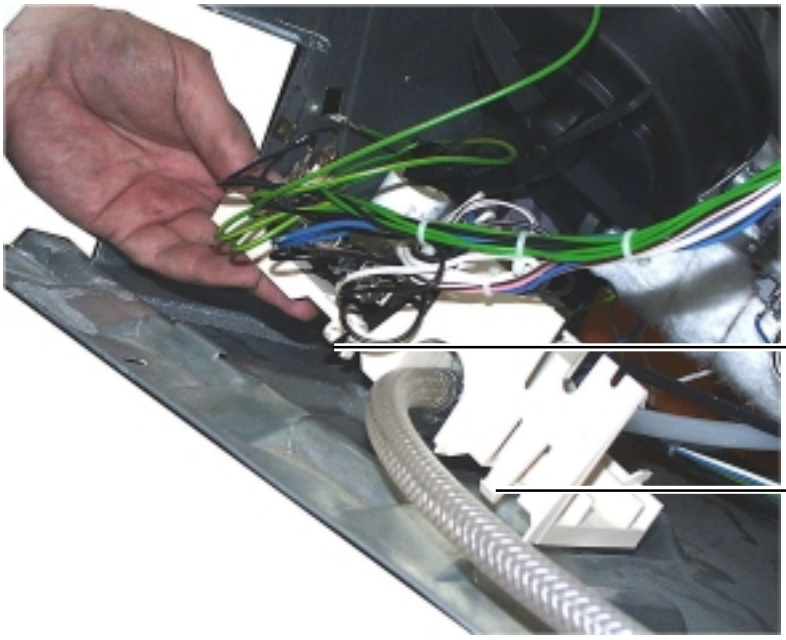
Water softener



These components are accessible from the front.

Thermostat 80°C

NTC sensor



Disengage the retainer for electrical components and pull it out to the front. The subsequent components are now freely accessible.

Holding notch

Holding notch

Overflow switch

Fuse for feeble currents

Heating contactor

Fill-in solenoid

Noise limiter

Condenser, recycling pump

Connection terminal, network

Water Softener

Water level in regeneration dosing system after one filling step.

If the water level falls during rinsing cycles, there is leakage on the salt cover, regeneration valve or inside the softener system.

This results in poor washing and salt stains on the dishes.

Dismantling the water softener system

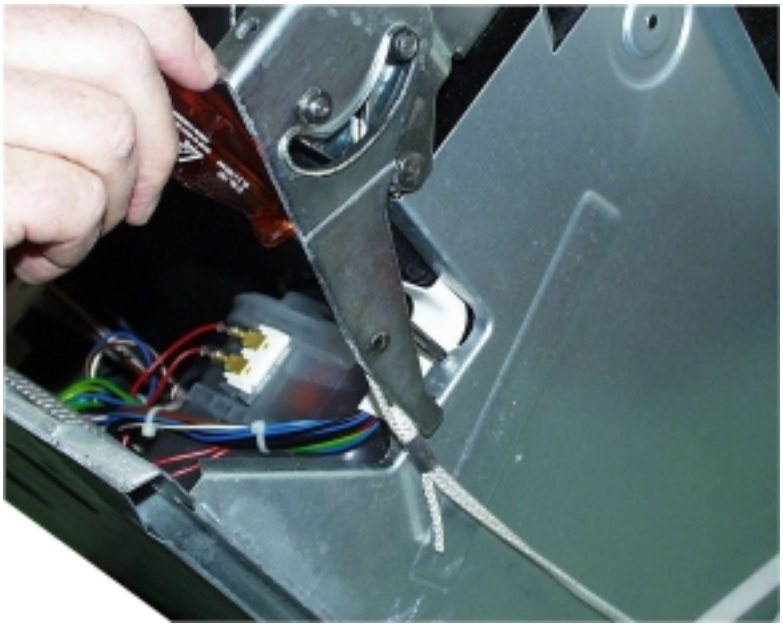
Water inlet, lift off cover, unscrew nut

Salt filler neck, loosen threaded socket by knocking lightly on the catches.

Take off cable control

Remove front base screws, only loosen rear screws.

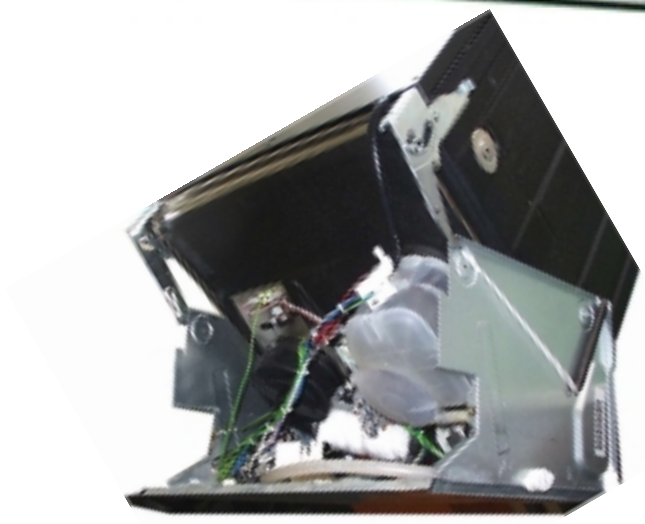
Remove front and rear base plate



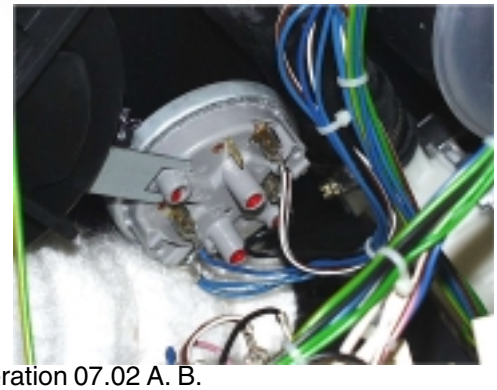
- Unscrew cable conduit.

- Loosen pump support from the base.

Pump support

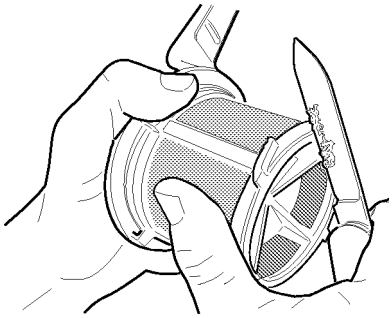


- Fold up the base as shown in the photograph. Now you can dismount the water softener system.

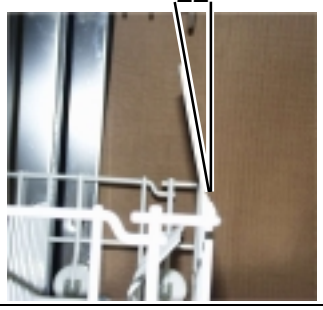


- You have now better access to the pressure control device, too.
No folding up of the appliance required for dismounting.

10. Handling of complaints

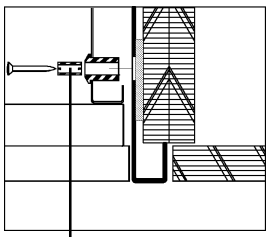
<table>
<tr><td colspan="3">... poor washing results</td></tr>
<tr><td>Cause</td><td>Problem</td><td>Solution</td></tr>
<tr><td rowspan="4">Spray arm clogged by micro-sieve malfunction</td><td>Gap between sieve and collecting trough caused by coarse contamination</td><td>Clean collecting trough and spray arm, advise customer</td></tr>
<tr><td>Sieve is not correctly locked in position</td><td>Clean collecting trough and spray arm, advise customer</td></tr>
<tr><td>When cleaning the sieves, coarse food remains get into the recycling pump circuit</td><td>Install new micro-sieve with dirt pan, PN 153 005 200/8, advise customer</td></tr>
<tr><td colspan="2"><u>Note:</u>
Micro-strainer handling is now easier by improved guide at collecting trough as from SN 015 80 186 and 015 90 185. With earlier manufactured appliances you can remachine the micro-strainer in the service, as shown in the figure, with the help of a knife.
  </td></tr>
<tr><td>Softener system internally leaking, high salt consumption, salt stains on dishes</td><td>Defect of fabrication</td><td>Check:
Observe regeneration dosing system, no falling of water level allowed ! Install salt cover (with red seal, PN 805 013 550 00/1).
Check again and exchange, if necessary, softener system, PN 153 013 300/6.</td></tr>
</table>

<table>
<tr><th colspan="3">... poor washing results in the lower basket, dosing compartment not well rinsed</th></tr>
<tr><td>Cause</td><td>Problem</td><td>Solution</td></tr>
<tr><td rowspan="3">Lower spray arm not rotating or rotating too slowly.</td><td>Heavy deposits of dirt inside the spray arm</td><td rowspan="3">Exchange spray arm,
PN 153 085 900/6
The novel spray arm has been introduced as from SN 037 801 76 and 037 901 73 with the following improved features:
- Inside is polished.
- Welding between spray arm upper part and lower part was improved
- Outer spray arm nozzles were enlarged from 2.6mm to 4mm.</td></tr>
<tr><td>Welding on the spray arm is damaged. Water splashing horizontally through the defective welding.</td></tr>
<tr><td>Remnants of detergent in the dosing combination due to unfavourable spray design, unfavourable loading, spray shadows</td></tr>
<tr><td>Wire bow used for pulling out the lower basket causes remnants of detergent to stick inside dispenser</td><td>Wire bow is bent vertically or to the front, so that dispenser cover cannot be opened wide enough</td><td>Bend the wire bow back to its original position by approximately ~22

<u>Attention:</u>
It is important that the detergent cover is stopped by the wire bow. If you bend the wire bow too far back, the cover will open too widely and then block the central spray arm.</td></tr>
<tr><td colspan="2"> </td><td>This is approximately the correct position of the washing flap during washing.</td></tr>
<tr><td colspan="2"> </td><td>If the lower basket is bent too far backwards, the central spray arm will be blocked.</td></tr>
<tr><td colspan="2"> 
</td><td>This is the position of the lower basket handle when delivered.</td></tr>
</table>

... poor washing results in the upper basket		
Cause	*Problem*	*Solution*
Central spray arm rotates too slowly	Drive nozzles are insufficient	Exchange spray arm. Only complete with connecting pipe, PN 153 027 200/2 The new spray arm was introduced as from SNs 106 803 36 and 106 903 31 with the following improved features: - Improved rotational speed by turboblades (change from left-hand to right-hand direction)
Central spray arm is blocked	Lower basket wire bow is bent back too far, detergent cover opens too widely, blocking the central spray arm.	Bend the wire bow to the front, as shown in the photo above
	Upper basket wire bow (limiting the load) is blocking the central spray arm.	Adjust wire bow.

Miscellaneous		
Cause	*Problem*	*Solution*
Tolerance position	When pushing the lower basket in, it could graze the door sealing on the right or left.	The basket is better centred in the washing compartment, if you bend the second roller from the rear a little to the front.
Door hinge is jammed.	Door cannot be opened.	Replace the hinge, PN 153 025 101/4 L.H. PN 153 025 102/2 R.H. The hinge was modified as from SNs 021 804 59 and SN 021 904 49.

Leakages		
Cause	*Problem*	*Solution*
Welding on the lower spray arm is damaged.	Water splashing over the washing compartment apron.	Replace spray arm, PN 153 085 900/6
Due to inappropriate fastening screws, the dishwasher is drawn apart on its upper part.	Water or vapour leaking.	Only use original screw with sleeve.  Sleeve
Wrong mounting of door seal	Seal is puckering in its elbows on the top right and left side.	Observe mounting instructions.

11. Service Instructions

11.1 Installation instructions for door sealing for dishwashers, PNC 153 02 37-02/1

- Carefully insert left-and and right-hand door seal, ensuring that both cut-in ends are folded at the base (Fig. 1)

- Install door seal as shown in Fig. 2 in such a way that the seal is slightly stretched in both radii (Fig. 3). Make sure that the sealing lip is not crimped or wavy in the radii and springs well back after pressing it with your finger (Fig. 4)

- Check for leakages

Fig. 1

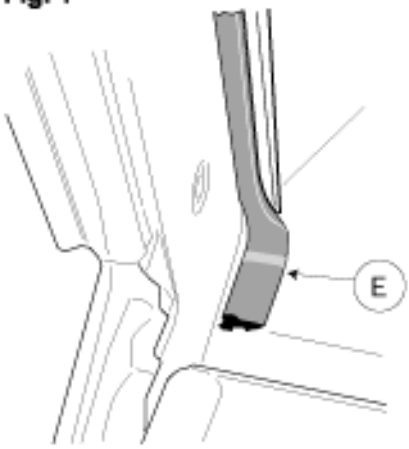


Fig.2

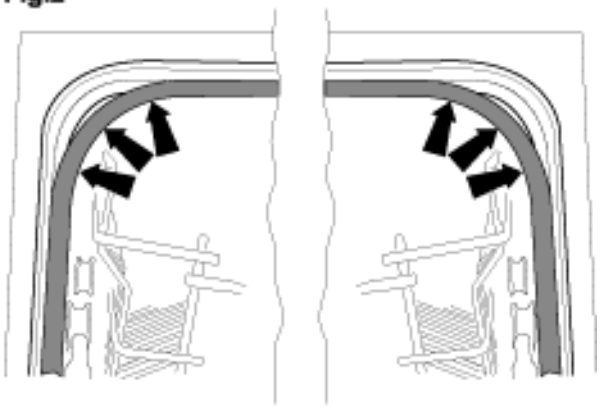
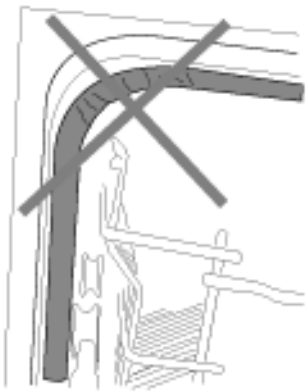


Fig. 3

Fig. 4.



11.2 Spacers on support panel and on electronic

Problem: Sometimes the electronic system may be accidentally activated by pressure on the glass or metallic panel, or it may remain activated constantly. Undefined faults may occur (e.g., programme stops, etc.)

Cause: Due to the different tolerances between electronic, support panel and design panel, the design panel could press with a permanent pressure on to the control keys and therefore initiate the electronic system.

Actions
Works: Metallic panel : From serial no. 1 11 80176/90177, design panel with shortened retreat (former 4 mm, new 3 mm) have been used. (Only control side, see Fig. 1)
As from serial No. 1 15 80088/90086, 5 off cushion-type buffers (round dia. 9.5 mm) are glued to the support panel and 1 off elastic buffer (hexagonal) is glued to the electronic case.

Glass face : As from SN 1 22 80201/90193, a cushion-type buffer is glued on to the electronic (see Fig. 2).

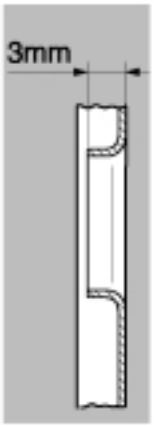


Fig. 1

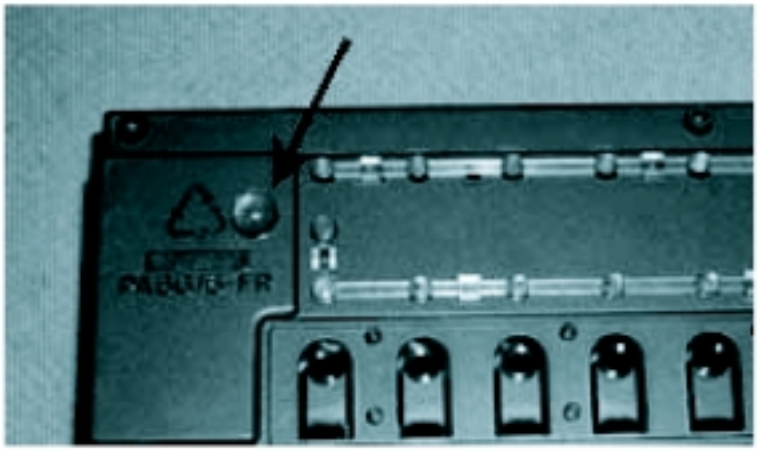


Fig. 2

Actions

Customer service: Metallic panel: With appliances until SN 1 10 80366/90378, exchange the design panel (fig. 5, order Pos. 511). Glue 5 off cushion-type buffers (round dia. 9.5mm) and 1 off cushion-type buffer (hexagonal) on to the electronic case (See photos 3 and 4).

With appliances of series nos. 1 11 80176/90177 to 1 15 80087/90085, glue 5 off cushion-type buffers (round dia. 9.5mm) on support panel and 1 off cushion-type buffer (hexagonal) on to the electronic case.

Set PN 153 03 73-00/0 (see photos 3 and 4)
Do not exchange the design panel.

Glass face: With models until SN 1 22 80200/90192, glue 1 off cushion-type buffer (round dia. 9.5mm) on to the electronic case (See fig. 2)

5 off cushion-type buffers (round dia. 9.5mm)

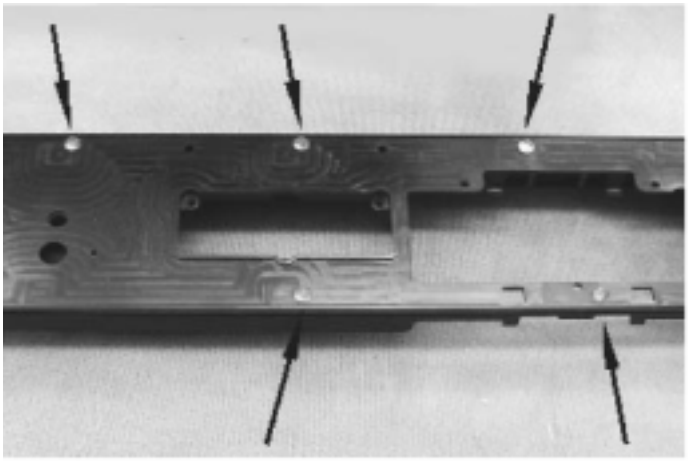


Fig. 3

1 off cushion-type buffer (hexagonal)

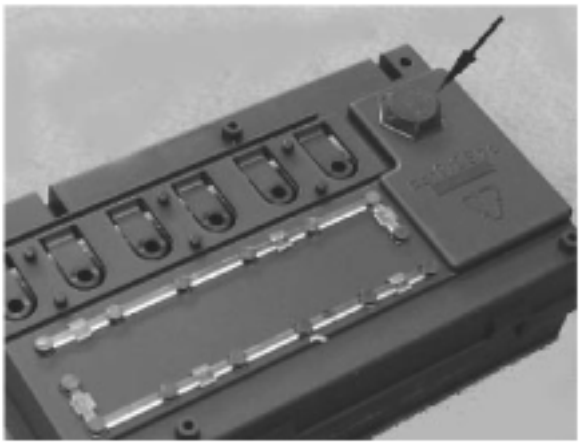


Fig. 4

Contents of Set 153 02 73-00/0 (required work set)
1 off cushion-type buffer (hexagonal)
7 off cushion-type buffers (round dia. 9.5mm) (2 off as reserve)
For glass panels, use the reserve buffers from the set for metallic panels.

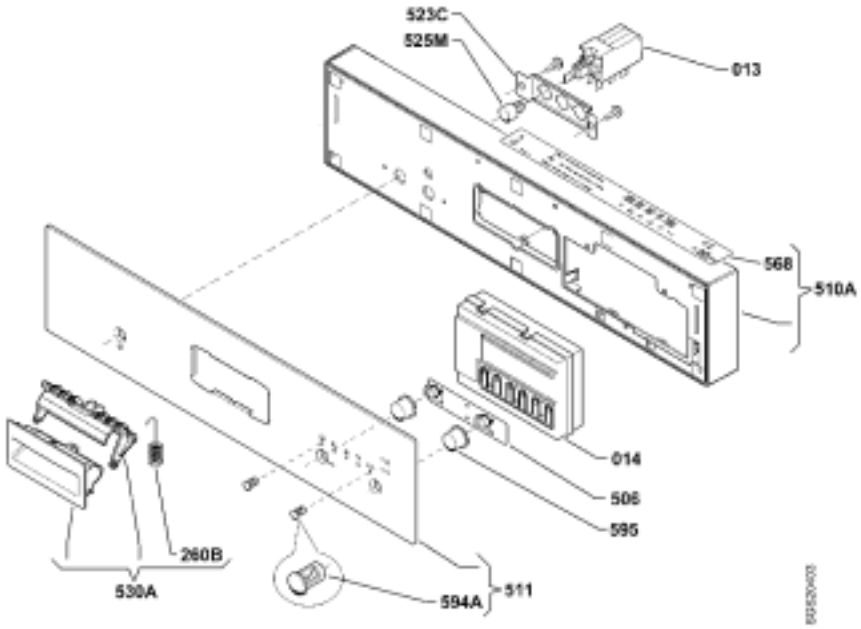


Bild 5

11.3 Top basket spray arm right-handed

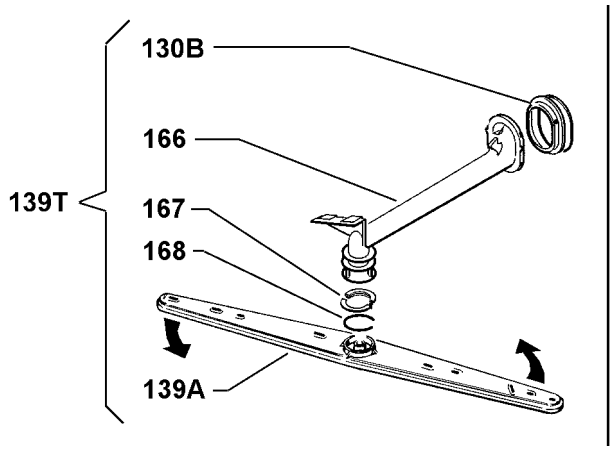
Carry out the modification together with AEG 60cm.

Actions
Works: As from SNs 1 06 80336 + 1 06 90331, newly install a right-handed instead of a left-handed spray arm.

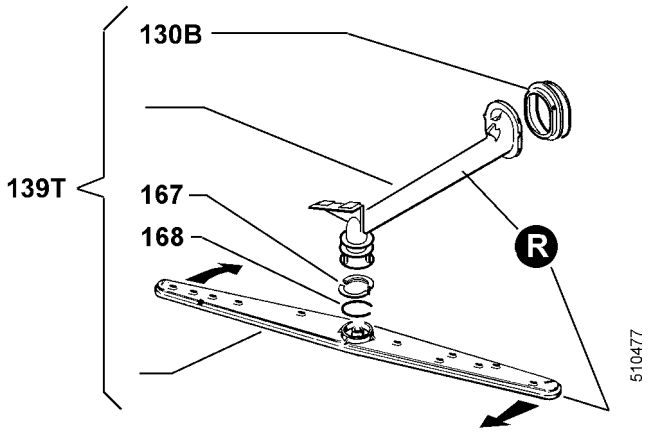
Features for identification : Impression of new item code and additional designation R.

Customer
service: Connection pipe 166 and spray arm 139A is «old», you cannot combine "old" with "new" , since these parts are no longer available as separate parts. Replace the two parts by the new item 139T, Set 153 02 72-00/2.
The new Set is suitable for both the old and new dishwashers. Items 130B, 167 and 168 have not been modified and are separately available.

Old parts until SNs 1 06 80335 + 1 06 90330 (left-handed)



New parts as from SNs 1 06 80336 + 1 06 90331 (right-handed)



Spare parts:
Item 139A => Item 139T, Set 153 02 72-00/2
Item 166 => Item 139T, Set 153 02 72-00/2

Pos. 139T, PN Set 153 02 72-00/2
Pos. 130B, PN 899 646 12 38-20/7
Pos. 167, PN 899 646 12 37-86/0
Pos. 168, PN 153 07-56-00/4